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Monitoring Times

A Publication of
Grove Enterprises, Inc.

*Plus
New Products,
Frequencies and
Listening Tips
for the
Radio Hobbyist*

Rebel Radio!

THE CLANDESTINE
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CUBAN HISTORY

- Experimenting With Homebrew Antennas
- The Night a UFO Landed on My Scanner

35

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Monitoring Times



Rebel Radio and Fidel Castro

By Don Moore

8

When Moore gets in a story-telling mood, it is always a good read. This time, we travel back to the early days of Radio Rebelde when communications played a key role in young guerrilla leader Fidel Castro's audacious overthrow of an entire system of government.

Homebrew Antenna Special:

Windowpane Coupling *by Bill Edwards* 14

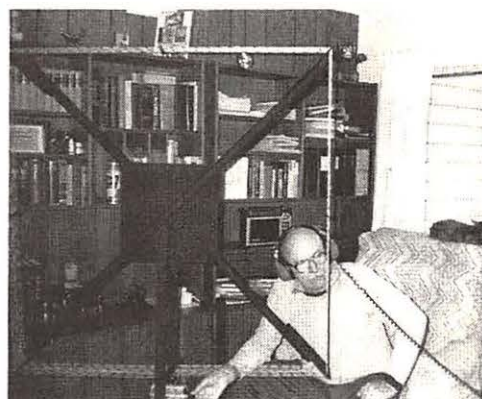
Do you have an external antenna, but no satisfactory way to bring it into the house? You can bring it in through the window — without drilling a hole or breaking a pane!

The Amazing Circle *by William Rhodes* 16

For TV reception under difficult conditions, this writer has found the best antenna is still a design he first encountered over forty years ago.

Broomstick Loop Antenna *by Ray Autrey* 18

Frustrated when a storm knocked out his external HF antenna, the author started scouring his house for materials to construct an indoor substitute ...



Jim Boehm and his MW loop.

COVER: Revolutionary Che Guevara looks over Havana from the Ministry of the Interior Building. Guevara helped establish the clandestine Radio Rebelde in 1958. The modern-day station is a part of the Ministry of Communications complex, whose tower is seen on the right. Picture by Bill Black.

The Accommodating Wire Antenna 20

By Joe Carr

Don't let the equations scare you off — these antennas really are cheap and easy. But if you want to go deeper into antenna construction, this article by one of the hobby's recognized experts is a good beginning to brewing your own.

The Night a Flying Saucer Landed on my Scanner

26

By Chuck Robertson

Yes, this is a special for the April issue, but it's no April Fool's joke! Here is proof positive that you can never predict what you'll hear on your scanner!

And Much More ...

Reviews this month include an affordable travel multiband receiver — the Grundig Yacht Boy 250; a handheld scanner manufactured by Uniden for Radio Shack — the PRO-46; and FM Atlas' SCA converted GE Superadio II.

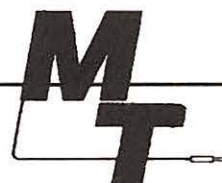


Much appreciated at this time of year are updates for the maritime monitor, found in "Utility World." Aero monitors also have a special treat in store with a personal visit to Ireland's Shanwick Aeradio in "Plane Talk."

In addition to the antenna articles featured this month, antennas are also addressed in "DeMaw's Workbench," and a full-wave loop is this month's "Antenna Topic." It's Spring! ... What better time to join us in a little "antennamania"?!

DEPARTMENTS

Letters	3	Shortwave Guide	60
Communications	6	Radio Vignette	86
Shortwave Broadcasting	28	Propagation Charts	88
Utility World	32	What's New	90
The Scanning Report	36	Scanner Equipment	94
The Beginner's Corner	40	Magne Tests...	96
Federal File	42	Computers & Radio	98
Plane Talk	44	Demaw's Workbench	100
Below 500 kHz	46	Experimenter's Workshop	102
American Bandscan	48	Antenna Topics	104
Satellite TV	50	Ask Bob	106
On the Ham Bands	52	Club Circuit	108
Outer Limits	54	Special Events Calendar	109
Reading RTTY	58	DX Radio Tests	109
QSL Corner	59	Stock Exchange	110



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LETTERS

Springtime makes us all a little foolish, especially those of us in cooler climes. So what's Jerry Witham's excuse?—he lives in Hawaii! This reader from the land of perpetual youth was inspired to send us a handful of April Fool's loggings. Here are a couple of them; you might want to come up with a few of your own!

1922 UTC on 5499.02

USA:WSCR (Senior Citizen Radio) Florida. A collection of Bing Crosby and Judy Canova favorites. ID at 1930 followed by tips on maintaining motorized walkers, then into Reggae music of the '40s.

2205 UTC on 4026.2

RUSSIA: Radio Moscow, Hawaiian Service, Hawaiian. Typical music of the islands until chants to the goddess Pele at 2220. "E noa kalaka Moscow" ID at 2230 followed by ancient Hawaiian melodies such as *Little Grass Shack in Hawaii*.

Radio Moscow Souvenirs

A reader asked in February about the North Atlantic Radio Service (P.O. Box 1, Marion Bridge, NS Canada B0A 1P0; 902-727-2727), which markets souvenirs for Radio Moscow World Service. Gigi Lytle of Texas says she ordered and received a sweatshirt about a year ago, and even received a personal message from Mr. Nikitenko, Deputy Director of Radio Moscow! Don Putnick also reported prompt service when he ordered a coffee cup.

I called to discover the current availability of Radio Moscow souvenirs. The NARS still has gold-embossed coffee cups, T-shirts and sweatshirts—all the old design with USSR on them. Since Radio Moscow's logo and even its name are still not fully settled, (For example, there was some discussion of changing to the "Voice of the CIS") it may be quite a while

before new versions are available, if ever. So you may want to order your souvenir today—it could become a collector's item!

Robert Dell, manager of the North Atlantic Radio Service, also works for Radio Moscow's English service. He described how difficult it is for a broadcaster to know how many people are listening, what their interests are, and what they would like to hear. Do you like to buy souvenirs, or is this a fad of the past? Do you have any suggestions for other ways listeners can show their interest or financial support for a favorite station? Now is a very important time to be writing in with your views, not only to Radio Moscow, but to all international shortwave broadcasters. Let them know you're listening.

C-Span

Armando Pasquini, "Your friend forever," lives in Guanajuato, Mexico, and uses short-wave listening for both information and recreation. "I piped a Sony ICF-2010 through a Fisher hi-fi to get reasonable audio quality, and I have been using this about eight hours a day. But my family is glued to the TVRO.

"For months I have been seeking the satellite audios in a hit or miss situation. Then *The C-Span Audio Networks* by Jeff Chanowitz! I still cannot believe I am now able to listen to all my favorite programs in true hi-fi—even *As It Happens* and the *Royal Canadian Air Farce* with all the words understandable! A fixed dish to Satellite C-3 and a TVRO receiver tunable from C-SPAN Audio 1 to Audio 2 keeps everyone happy. Thanks and more thanks!"

Malcolm Kaufman of Cambridge, MA, thinks his cable reception is pretty typical, and he wants to "take issue with the glowing account Jeff Chanowitz painted of the C-Span Audio Networks. The BBC feed (Audio 2) is fine and material originating in the Audio 1 studio is also quite good. But the satellite feeds for Audio 1 are invariably substandard, whether it is the feed intended for Sackville or off of VOA's satellite.

"Reception off the air, when good, easily exceeds the audio quality. Audio 1 works best as a backup if over the air reception is impossible. It is a solid concept, but has a long way to go in implementation."

British-born Derick Ovenall of Wilmington, DE, finds that, on Audio 2, "It is great to be able to pick up the BBC at any time of the day with no problems from interference or propagation, and the audio fidelity is excellent. This has increased enormously my enjoyment of the World Service classical music program. Thanks once again for this valuable article."

Loren Cox of Lexington, KY, correctly points out the inaccurate picture painted when we

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This beautifully-scripted note
from the deputy director
certified Lytle's souvenir.

LETTERS

stated that "C-Span downlinks the signal before it goes to RCI's transmitters."

"Of course, what is actually happening is that the SCPC transmissions of international broadcasters on Anik E1, Tr. 10, can be received simultaneously by anyone within the C Band footprint of Anik E1 who has the appropriate satellite reception device.

"The Voice of Free China feed, no longer being downlinked/uplinked by C-Span for Audio 1, remains available on Galaxy 6, Tr. 3, SCPC. In addition to C-Span's high fidelity relay of the BBCWS (Audio 2), other satellite sources of the BBCWS in N.A. are SCPC feeds on Galaxy 6, Tr. 3 and PanAmSat 1 (the latter interrupted for Spanish language programming). Audio 1 and Audio 2 are now being radiated from Satcom C3, Tr. 7, 5.22 and 5.40 MHz respectively."

Thanks, But ...

Here are some other letters that express appreciation for an article, BUT...

- Gary Memory of the American Embassy in Athens, Greece, finally got his November issue (two months seems to be standard delivery time for overseas subscriptions!) and read with interest the description of amplitude modulation in the Beginner's Corner. "Mr. Arey stated that 'modulating the carrier wave...was done by changing the amplitude or height of the carrier.' Although this is commonly thought to be the case, the carrier in a properly operating AM transmitter does not change in amplitude. In fact, within the AM broadcast band, broadcasters are restricted to very small changes in amplitude output in the carrier.

"Properly stated, amplitude modulation is a sum of the carrier and one or more sidebands. Further, the carrier can be removed prior to transmission and reinserted at the receiver. Either way a constant carrier is involved in order to facilitate proper demodulation. Change in amplitude is caused by the carrier and sideband(s) mixing together."

- Howard Ragan of Cornelius, Oregon, enjoyed the February article on "Cross Country Communications," BUT ...

"You should at least have mentioned WHAT book to buy to get the frequencies in the area of interest. You can generally get the book at a FBO and it's called *Airport/Facility Directory*. Cost here at HIO country is \$3; the chart to find the actual locations of any beacons, Flight Service Stations, RAPCONs, etc., is called a Sectional Aeronautical Chart and costs about \$6.

"ATIS does not mean Automatic Transcribed Weather Service...it does mean: Automatic Terminal Information Service. The DME is TACAN, and that furnishes the readout on your DME Distance Measuring Equipment (DME)."

Figure 1

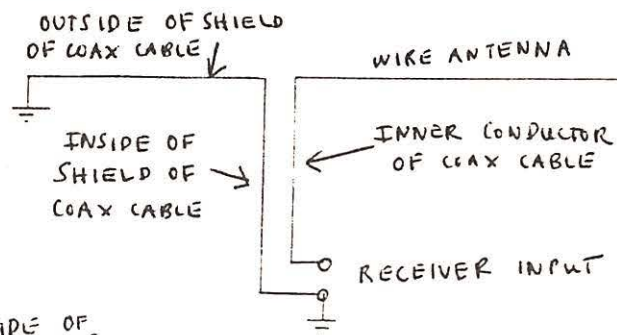
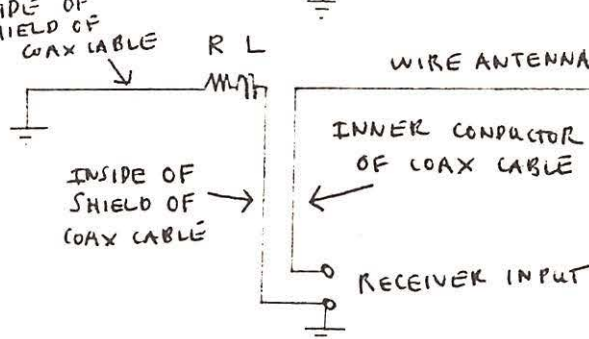


Figure 2



"Don't mean to be picky, but your article was interesting; and to think that I started flying with an L4 which had a compass for a Navaid."

Well, Mr. Ragan, I appreciate the information; I certainly did know better on ATIS and let it slip by. But I count at least four unexplained acronyms you used in "clarifying"! It's an occupational hazard whenever one knows any field very well. Advice to prospective writers: PLEASE, remember to take nothing for granted. You've told us the book to buy—now what is an FBO?

A Balanced View

The assertion by Doug DeMaw in the February "Letters" column that balun transformers are of no use with longwire antennas or at impedances greater than 500 ohms, etc., brought a flurry of letters. In support of the use of a balun were Jack Althouse of Palomar Engineers, and Edward Campbell of Yonkers, NY. Campbell found that the Palomar Magnetic Longwire Balun did reduce noise, although not dramatically, from 100 kHz to 30 MHz with both antenna ends grounded. MT's Clem Small also testified in a phone conversation that, in practice, when used with open wire transmission line of 200 feet or more, a 4:1 balun had been found to be helpful.

Supporting the view against using a balun with a longwire were Paul Lalli of McAlester, OK, Dr. Dallas Lankford of Louisiana Tech, and Derick Ovenall of Wilmington, DE. Ovenall and DeMaw both speculate that the device may not be a balun transformer at all, but more properly called a "choke."

If that is so, says Ovenall, "in the case of an elevated, random length, single wire antenna, placing such a device at the antenna end of the coax feed line would prevent the outside of the coax from becoming part of the antenna. This can be seen from the two figures above. In figure 1,

I have drawn the antenna without the choke (or "current balun"). For the sake of clarity I show the outside and inside of the coax as two separate conductors. It can be seen that the outside of the coax is part of the antenna, which behaves as an unbalanced dipole with one end grounded. Signals and interference picked up on the outside of the coax will be fed to the receiver input and will affect reception.

"Figure 2 shows the antenna with the balun connected. If the impedance of resistor (R) and inductor (L) in series is high, rf currents picked up on the outside of the coax are prevented from reaching the receiver input." Ovenall recommends Walt Maxwell's book *Reflections* published by the ARRL, or Curt Wilson's article in *QST*, November 1992, page 65, for more reading on theory and construction of chokes.

For more information on the use of baluns, see this month's "DeMaw's Workbench," already composed before the topic arose in "Letters." DeMaw does add, "500-ohms was for many years the recommended standard for broadband transformers. The limit is by no means sacred. I acknowledge that some manufacturers are now producing broadband transformers with a 1000-ohm high-side value."

Space does not allow for a more technical discussion of the pros and cons raised by these letters, but we appreciate the thoroughness and the detailed nature of all your responses.

Help Wanted/Help Given

- Tom Hirsch, news photographer and assignment editor for WESH-TV Channel 2 in Orlando, Florida, is looking for help from other news agencies who have dealt with a trunking system. Orange County is installing one to coordinate public safety communications in a tri-county

Continued on p. 111



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SCHEDULE

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7:00 to 9:15 pm
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Saturday, October 16

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Exhibits Open and
Morning Seminars
12:30 to 3:00 pm
Exhibits Open/Lunch Break

Saturday cont'd

3:00 pm
Exhibits Close
3:00 to 5:15 pm
Afternoon Seminars
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Friday evening starts the weekend off with a two hour "Hobby Talk." Moderator Bob Grove will host this open forum of attendees, speakers, international broadcasters and specialists in the radio hobby field.

Topics will include the new scanner laws, the future of shortwave broadcasting, new technology and much more. The balance of the weekend seminars will include these new topics for 1993:

An Introduction to Computers
Monitoring SW Military/HF and USB
ELF—Are We Being Fied?
Choosing a Scanner/SW Radio
Monitor the Feds!
Beginner's Introduction to Electronics
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• Shortwave—How to improve reception
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LOWFERS—Earthquake Monitoring
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Shortwave Broadcasting: The Future
A Beginner's Guide to TVRO
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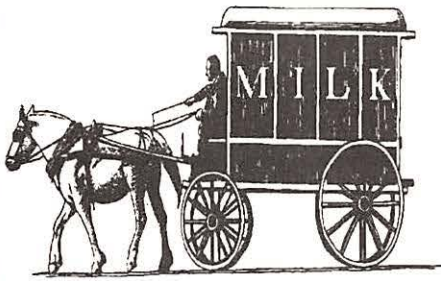
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The DJ and the Milkman

It was the end of a long, hard day for Radio Vika announcer Karl Bonde. Sitting down in the studio of the Norwegian FM station after sign-off, he picked up the phone and dialed a sex line in Hong Kong. The tape was about a milkman who offered sex on his rounds. Unfortunately, Bonde forgot to turn the transmitter off and an audience estimated at about 20,000 unwittingly shared in the announcer's sexual fantasy.

"We got a lot of people ringing to complain," said station spokesman Karl Christian Haugen, "although in retrospect it sounds a bit funny. Not to announcer Bonde, though. He may be out of a job. Station officials are reportedly still deciding whether to fire him."



More Bad Radio Laws

Redundant legislation is now before the Georgia legislature that would make it illegal to listen in on cellular phone conversations "without the approval of at least one of the speakers." Under federal law, it is already illegal to listen in on cellular phone conversation even if given permission by one of the speakers.

In Minnesota, five legislators have submitted a bill removing the exemption that allows amateur radio operators to equip their vehicles with radios capable of receiving police frequencies. As you know,

amateur radio operators often have a strong criminal bent and often use their rigs while committing felonies! Remember the names of the bill's sponsors — Delmont, Dawkins, Jacobs, Swenson and Perit — at election time.

Connecticut's Supreme Court has decided that police must obtain court approval before "tapping" a cordless telephone conversation during a criminal investigation, even though private citizens do it routinely. William Olds of the Connecticut Civil Liberties Union said, "It appears that they've said 'a phone is a phone is a phone.'"

While most states have not ruled on the issue, this decision seems more in line with the venerable Communications Act of 1934, which prohibits any publicizing or profiting from private conversations, than are recent attempts to make simply listening to a certain part of the spectrum illegal.

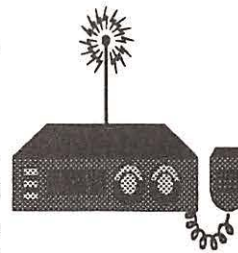
FCC Dumps Commercial Testing

Commercial radio operator licenses have gone the way of ham radio. The Federal Communications Commission, in a surprise move, has turned the testing process over to private entities who will administer the examinations. As with ham licenses, the actual license, however, will still be issued by the feds.

Good News for Illegal CBers

According to several officials within the FCC Commission, deep funding cuts now prevent the Commission from investigating reports of either intentional or unintentional interference caused by CB radios. None of the sources within the FCC had suggestions as to how such offenses could or should be handled.

MT publisher Bob Grove suggests that you first contact the suspecting offender, then try the nearest FCC field office anyway. If both steps fail, Grove says to file a civil complaint.



Radio Flintstones

Working at Radio Yerevan, Armenia, isn't easy. During the first two weeks of the new year, non-news programming in eight languages were dropped. The problem is caused by the nation's energy crisis.

Now, say station officials, the English newscast is being read and recorded by candle light. The Spanish and French bulletins are sometimes left unrecorded. Still, says a spokesman, "we have determined to continue our work no matter what the conditions."

Radio Hooliganism

A report in the newspaper Izvestiya gives some interesting insight into the working of Soviet radio under Communist rule — and what it faces today.

In order to avoid the possibility of picking up unwanted outside broadcasts, the city of Moscow was, in 1921, rigged for wired radio. Enterprising individuals, however, "broke in" to the system after regular broadcasting hours, plugging in an amplifier, a tape recorder and a microphone, and broadcasting to residents of nearby blocks. According to the report, it was in this way that the Voice of America was "put out" over the air. Today, the "radio hooliganism" continues although the programs now are mostly music programs, advertising, announcements and sometimes even "unprintable abuse."

Aleksandr Khabin, chief of the Moscow City [wired] Radio Relay Network says that although they can now easily track down the pirates, "There is no law against them, unless you count the 'petty hooliganism' heading." Besides, "they seem to do no particular harm..."

No Tumor — Just a Headache

Software capable of reprogramming cellular telephones without removing the chip is being copied and spread across the U.S., according to Lee Kaywork of McCaw

COMMUNICATIONS

Cellular. Two men were charged in New York with using personal computers to reprogram their cellular phones to bill phone charges to other customers. The software was allegedly developed in London.

Speaking of cellular headaches — in an effort to ease anxieties about the link between cellular phones and brain tumors, several companies are funding more studies, as we had predicted. McCaw Cellular, for example, has ordered a computer-simulation quantization study of EMF radiation absorbed by the head during cellular phone use. Northern Telecom is funding a research project on the effect of radio emissions on the body, and AT&T is studying the rate of absorption of electro-magnetic fields by users.

See You in the Car

Using an FCC "Pioneer's Preference," a company called CellularVision says it's ready to provide up to 49 video channels of "cellular TV."

According to engineer Bernard Bossard, the technology uses the 27.5 MHz to 29.5 MHz spectrum allocated to the local Multipoint Distribution Service (LMDS), newly authorized by the FCC.



The main signal is transmitted via an omnidirectional antenna to the various cells, which then transmit the signals via a highly directional antenna to homes and other cells.

Meanwhile, the FCC is reportedly working on a recommendation that would allow licensees of UHF TV stations to use their frequencies for cellular phones instead. According to the paper's authors, the removal of a single UHF TV station in Los Angeles from service and the use of its frequency for cellphones "could increase the net social welfare" by over \$1 billion.

Radio R.I.P.s

Harold Beverage, a radio engineer best known among hobbyists for his Beverage antenna, died at the age of 99. Beverage, a radio engineer and RCA scientist, held more than 40 patents.

Graduating from the University of Maine in 1915, he was already winning awards and the praise of his peers when, at the age of 30, he received the Morris Liebmann Memorial Award for his contributions to the development of trans-oceanic radio. Numerous other awards as well as a biography, *Genius at Riverhead*, followed.

Fritz Gross, a world renowned pioneer in the design and development of radar systems, has died at the age of 82. Mr. Gross, who was born in Germany and who moved to the United States in 1912, developed the "SG" radar, which allowed U.S. ships to "see" at night during World War II.

Raytheon CEO Dennis Picard said, Gross' work "saved literally thousands of lives" during the war.

"Communications" is written by Larry Miller from a variety of sources, including material submitted by the following readers: Dave Alpert, New York, New York; Harry Baughn, Murphy, north Carolina; Steve Benedict, Henry Brown, Massachusetts; Richard Cinert, North Judson, Indiana; Dick Holbert, Rochester, New York; John Galeota, Broadbrook, CT; Bob Grove, Brasstown, North Carolina; "Mac"; Ken Mason, Washington, D.C.; Frank Mitchell, Gaffney, South Carolina; Ricardo Molinar, Ft. Lee, NJ; Quentin Sassbill, Peterboro, Vermont; Craig Thrasher, San Diego, California; Ken Zynda, Depew, New York; Mr. Anonymous, the BBC Monitoring Service, *National Scanning Report* and the *W5YI Report*. Submissions from any source, on any topic related to communications, are appreciated.

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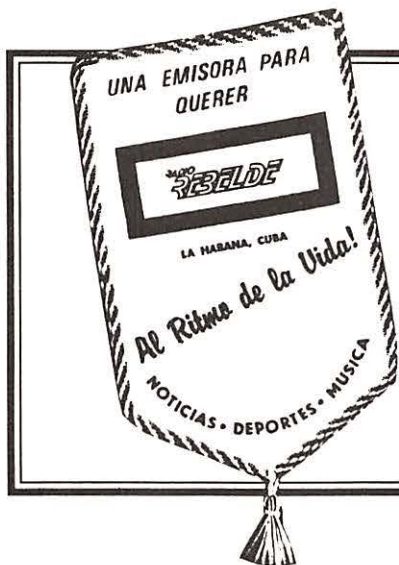
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Rebel Radio and the Rise of Fidel Castro

Story by Don Moore

We may have celebrated victory over Communism, but it isn't gone.

Ninety miles away, Fidel Castro continues his grip on Cuba. Once a "thorn in our side," today he's a pinprick. The glory days of revolution are over. Still, Castro is a crafty politician, and never was that more clear than in his rise to power. As unreal as it seems today, in the 1950s Castro emerged as Cuba's only real hope for freedom. He overthrew a corrupt dictatorship, brought hope to the Cuban people, and wrote one of the most fascinating stories in the history of clandestine radio — the story of Radio Rebelde.

In the early 1950s, dictator Fulgencio Batista ruled Cuba by gangsterism. His political enemies were brutally murdered and military leaders ran

protection rackets, raking in millions of dollars. Havana became a center of gambling and prostitution. Most Cuban people hated Batista and were waiting for someone to overthrow him.

Fidel Castro believed he was the one, and on July 26th, 1953, he gathered about 100 followers for a surprise attack on the Moncada barracks in Santiago. After capturing Moncada, the people would flock to him; he would hand out the barrack's weapons and march on Havana. But, it wasn't that easy. Moncada's one thousand soldiers easily repulsed Castro's band. Many were killed and most others were butchered in the streets of Santiago, along with some innocent civilians.

A lucky few, including Fidel, escaped to be captured after the army had calmed down. For show, Batista put the survivors on trial, but it was

Castro who provided the show by making a brilliant speech in his own defense. Castro was sentenced to fifteen years imprisonment, but he had become a hero to the Cuban people.

Castro's luck changed in May, 1955, when Batista declared a general amnesty. Castro left for Mexico, where he formed the 26th of July Movement to overthrow Batista. Several dozen Cubans joined him, as did an Argentine doctor, Che Guevara, who would become his right-hand man. In 1954, Guevara had been in Guatemala, where he saw first hand how a CIA clandestine broadcaster, La Voz de la Liberacion, helped overthrow Guatemala's elected leftwing government (see *Revolution! Radio's Role in the Overthrow of Guatemala*, MT 4/89).

Guevara now distrusted the United States, but

The Edificio Radiocentro, which houses the Instituto Cubano, ICRT, (Cuban Institute of Radio and Television) and Radio Rebelde.

Radio Rebelde pennant and QSL card are courtesy of The Committee to Preserve Radio Verifications, a committee of the Association of North American Radio Clubs. For more information on CPRV, write Jerry Berg, Chairman, 38 Eastern Avenue, Lexington, MA 02173.



appreciated radio's role in warfare. By late 1956, a small yacht had been purchased and Castro was ready to take on Batista. Eighty-two men left for Cuba on November 25. Among the supplies was a transmitter. The revolution had begun.

The Sierra Maestra

They landed in eastern Cuba December 2, a few days' march from the Sierra Maestra mountains. Three days later, while they were resting in a field, the army surprised them. About a third of the guerrillas were killed or captured immediately. Much of their equipment, including the transmitter, was abandoned as they fled in small bands. The army pursued and butchered any group that surrendered or was captured.

With the help of friendly peasants, the survivors slowly came together in the mountains. They numbered only about 16, including Fidel, his brother Raul, Che Guevara, and Camilo Cienfuegos. Tuning in Havana stations on a peasant's radio, they smiled at reports that all of them had been killed.

As Castro's forces grew, he divided his men into columns under various commanders, including Raul, Guevara, and Cienfuegos. Several columns operated in the Sierra Maestra, west of Santiago, while others operated east of Santiago. Later, more columns were added in the plains of northern Oriente and the Escambray mountains of Central Cuba. One, under Dermitio Escalona, formed in Pinar del Rio, a province on Cuba's western tip (map on p. 10).

The army holed up in towns, freeing the guerrillas to establish base camps. The central camp resembled a small city with a hospital, schools, a small newspaper, and a small hydroelectric station. Later, the guerrillas ran telephone lines through the mountains, connecting several columns and villages. A small leather workshop produced boots and cartridge belts, and an armory recharged spent cartridges and produced bombs, grenades, and mines from makeshift materials such as tin cans. There was even a small cigar factory.

Radio Rebelde

Che Guevara knew clandestine radio was the only way to speak directly to the people. Guevara found a technician, an ex-reporter, two ex-announcers from Havana's popular Radio Mambi, and an old ham transmitter. A test broadcast was made in mid-February. The transmitter needed work, so the 20 minute broadcast only reached a few hundred yards, with Fidel and some guerrillas around Che's radio and a peasant named Palencho



QSL

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Jerry Berg

who lived on the facing hillside as the only audience. But, Fidel was impressed.

Work on the equipment continued, and on February 23, 1958, Radio Rebelde was officially inaugurated in its first real transmission. Into the airwaves went the words that would soon become immortalized in Cuban broadcasting; "Aquí Radio Rebelde! Aquí Radio Rebelde! Transmition desde la Sierra Maestra en territorio libre de Cuba."

Contacts in Miami arranged a secret airlift of better radio equipment. Carlos Franqui, former underground newspaper editor, became Rebelde's director. More staff was recruited and programming expanded. Slowly Rebelde became the center of a clandestine radio network.

Rebelde broadcast regularly at 7:00 and 9:00 pm on 20 meters and at 8:00 and 10:00 pm on 40 meters. Each transmission began with the Cuban national anthem and the revolutionary hymn. Programming became more professional, and included "bulletins recounting guerrilla victories, speeches of rebel commanders, ... patriotic poems, music by its own 'Rebel Quintet,' and personal messages to rebel families ('Mama, this is Pepito. Don't worry, I'm fine')." 1

Most columns were given transmitters and eventually 32 Rebelde stations were scattered across Cuba. The satellites wrote material to feed to the main station, which put together and transmitted the daily broadcasts, also relayed by the satellites. It was a highly efficient and effective operation. The hub stations used names relating to their locations, e.g. Radio Rebelde Llano (plains) or humorous nicknames such as Barbudos Feroces (ferocious bearded ones). Some, such as Ocho Chicos Malos (eight naughty boys), broadcast their

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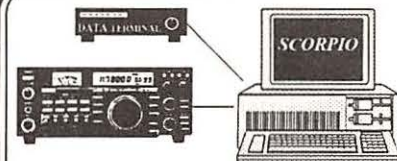
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own programs of news and fake soap operas spoofing the government.

The Rebelde network also served as a radio-telephone link for the guerillas, using the call 7RR instead of the Rebelde name. Coded messages from 7RR told of enemy movements and directed guerilla maneuvers. At times Fidel left less-important instructions uncoded, so listeners would feel closer to the revolution. Tactical broadcasts were almost as popular as Rebelde's nightly programs. Fidel also gave frequent speeches; sometimes walking two or three days to make a broadcast.

Frequently, Batista jammed Rebelde, but it wasn't effective and only made the station more fascinating. He even tried to confuse listeners with a "black" clandestine, *La Voz de la Sierra Maestra*. However, nothing kept Radio Rebelde from becoming Cuba's most listened-to station.

Castro-supporters outside Cuba set up the clandestine Cadena de la Libertad (Liberty Chain) for daily contact with the revolution and to relay Rebelde. The Cadena's four stations were Indio Azul and Dos Indios Verdes (Blue Indian and Two Green Indians) in Venezuela, Indio Apache in Mexico, and Un Muchacho Unido (A Together Guy) in Miami. Furthermore, commercial stations in at least ten Latin American countries relayed or played tapes of Rebelde. Venezuela's Radio Continente was especially important for its regular relays which were easily heard in Cuba.

Unlike the regular Cuban media, Rebelde told all the news, good or bad. Because Batista suppressed the truth, Castro could afford to tell it. The people trusted Rebelde and its audience grew. Everywhere people closed their windows at night and tuned in Rebelde.

Even political prisoners clandestinely listened to Rebelde. Colonel Ramon Barquin, who had led an abortive uprising against Batista, was one; "All

he could do was wait once again for nightfall, when he would pull the small transistor radio hidden beneath his mattress and place it next to a steel beam which served as an antenna. That way he could listen to ... uncensored reports of the fighting." ² DXers, of course, also tuned in. Many frequencies were reported, including 15320 and 14240 kHz.

Widespread Revolution

Castro had thousands of supporters in the cities who donated money, weapons, food, and other equipment. Businessmen turned Lions' and Rotary clubs into revolutionary fronts. Urban units planted bombs, and priests put coded memos in radio sermons. But the support of rural peasants was the key to Castro's revolution. Traditionally, peasants counted for nothing; the military stole whatever they wanted and shot peasants at the slightest complaint. When wealthy landowners wanted to expand their holdings, they bribed the army to evict neighboring peasants from their lands.

Castro treated the peasants with respect, paying for food he took, often at twice the market value. The rebels held adult literacy classes and free medical clinics for them. In return, the peasant grapevine informed Castro of the army's movements. Many peasants joined the guerillas.

Castro's forces also included foreigners. Some, like Guevara, were ardent revolutionaries; others were adventurers looking for a good time. Most were a little bit of both. Neil Macaulay, a former US army officer, joined the Pinar del Rio band in September, 1958. Escalona's column was the most isolated of the guerillas; they didn't have a two-way radio. Macaulay writes, "Escalona, however, did

have a shortwave receiver—a magnificent Zenith Transoceanic that he had appropriated from the home of some informer—and he could keep abreast of the situation elsewhere on the island by tuning in the nightly broadcasts of Radio Rebelde from the Sierra Maestra. Whenever possible, I joined those who gathered around the Commandante's radio." ³

Fidel on the Offensive

The army gradually confined itself to the towns, leaving the countryside to Castro. As the war swung in his favor, Fidel's greatest fear became that a coup might replace Batista with a general. Too many revolutionary movements had lost focus when a change was made in a country's leadership. Opponents of the government waited for great changes from the new leader. Usually little changed except the man in charge.

In late August, Fidel went on Rebelde to tell Cuba that a coup would not be enough. The entire government had to go. Fidel discussed this scenario with his advisors, including Franqui. They agreed that if a coup happened, Rebelde would go on at once and instruct their supporters to keep the war going.

In September 1958, Rebelde announced that Castro would go on the offensive. Six columns under Guevara and Cienfuegos moved towards the island's center. It was no longer a guerilla war; Fidel planned to attack and capture the towns. The guerillas had never lacked potential recruits; they lacked the weapons to arm many more guerillas. Most guerilla armaments were captured from government forces, so taking towns would mean a rapid increase in guerilla forces. With each defeated garrison, captured weapons could arm more peasants. The larger forces could attack larger garrisons, capture more arms, and arm more peasants. Soon the guerillas would threaten major cities.

In early December, Rebelde carried out one of its most important broadcasts. A sympathetic American businessman placed large ads in Cuba's most popular newspapers and magazines reading simply "What is 03C?" He said the ads were a teaser campaign for a new hair tonic. The next ad would reveal 03C stood for zero calvicie (baldness), zero caspa (dandruff) and zero canas (grey hair). The intriguing ads were soon the talk of Havana.

A few nights later, Radio Rebelde gave the real answer: "What is 03C? Zero Cinema. Zero Consumer Purchases. Zero Cabaret." Rebelde urged people to only buy the barest necessities to bring the economy to a halt. "If all Cuba is at war, don't you go to the cabaret!" The people listened and the Cuban economy slowly began to collapse.

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Elsewhere, the guerillas found novel uses for radio. In early December, rebel Captain Perez Alamo's men stole Santiago police chief Haza's new Oldsmobile 98. From their mountain hideout overlooking the city, every night the guerillas gathered around the car as Perez revved up the engine. Then he turned on the police radio and announced, "Listen, Haza. We still have your car here. When are you going to come get it?" The guerillas roared at the obscenities that came back.

The Fall of Batista

In central Cuba, Che was arming hundreds of peasants who were flocking to him. Other columns joined Che's, and soon he had an army ready to assault Santa Clara, Cuba's third largest city. By December 28th, most of eastern Cuba was under Fidelista control. Santiago was under siege and the battle for Santa Clara was about to begin. On December 31st, Batista's fall seemed imminent. Fidel's column occupied Palma Soriano, near Santiago. Radio Rebelde, with a 120 watt Collins 32-V-2 transmitter, moved into a bedroom in a little corner house at 201 Quintin Banderas Street.

In Pinar del Rio, Escalona's column listened to news of the battle at Santa Clara. When Macaulay tuned in US AM stations on the Transoceanic, all news focused on Cuba. Cuba was the lead story in Edward R. Murrow's last broadcast of 1958. He said reinforcements had arrived in Santa Clara and the guerilla offensive had been stopped. Next Macaulay found Rebelde and 7RR. Guerilla radio traffic was frenzied; it didn't sound good for the revolution.

"Cuban Red Cross Calling, Cuban Red Cross ..."

"Listen here, chico, we have six comrades badly wounded at kilometer sixteen ..."

"OK! OK! We shall try to send a truck out for them. In the name of God, tell your people not to shoot at us ..."

"Calling Comandante William Morgan! Comandante William Morgan!..."

"Hear me! Hear me! Send us reinforcements. We need help - ammunition! If we stay here they will wipe us out. We are going to move north..."³

The broadcasts were very chaotic, so Macaulay scanned the dials. Venezuelan Radio Continente's usually accurate news said the Fidelista offensive was doing well. Radio Moscow exaggerated, putting the rebels in control of cities that hadn't been attacked. A Dallas AM station gleefully announced Castro's end. The 11:00pm CBS news was all bad. "Forces loyal to President Batista of Cuba have defeated a large rebel force at Santa Clara."³ On that depressing note, Macaulay turned in for the night.



The next morning was New Year's Day 1959. Macaulay woke at 7:00 am and tuned in a Key West AM station. The news was shocking, but clear — Batista had left Cuba!! He shouted "Batista sali!!" and the rebel camp erupted in chaos. Macaulay translated; details were sparse, but General Cantillo was now in charge, and Batista was in exile. Furthermore, Che had taken Santa Clara!

Retuning the Zenith, they heard rebels in Santa Clara congratulating each other, but the main Rebelde station wasn't on. Havana stations only played music, saying nothing about the coup. Escalona gathered his men to march to the lowlands; they would block the highway. As they walked, they kept the Zenith tuned to CMQ, Havana's largest station.

***"Rebelde announced that
Castro would shortly
speak; the news spread
quickly."***

In Palma Soriano, Carlos Franqui had also gotten up at dawn. While he was walking to Radio Rebelde, some villagers told him Batista had fled the island. Franqui ran to the station to make contact with Havana. Vicente Baez, a 26th of July leader in Havana, affirmed that Batista had fled and added that General Cantillo was trying to form a junta. In Havana, Castro's underground was already taking control of radio and TV stations.

Short announcements were mixed with continuous playing of the national anthem. Citizens were ordered to remain indoors and all businesses told to close.

Fidel Speaks to the People

Fidel had been in the countryside. Walking to Palma Soriano, he forded a stream to a cheering crowd. As he stood there in dripping pants, the people told him Batista had left and the war was over. Fidel cursed. Couldn't they see this was a coup to sidetrack the revolution? He rushed by jeep to Radio Rebelde — his best hope to avert disaster.

Rebelde was in touch with Santiago's CMKC, which told Castro that revolutionaries had taken over many buildings and were patrolling the streets in Havana and Santiago, but the army was still in its fortresses. Castro kicked everyone out of the room except Franqui and the technician. He wanted to broadcast a speech and at the same time record it for repeat airing. That was impossible with their set-up. He would have to record first, then broadcast.

Castro stepped aside and glanced over some scribbled words in a battered pocket notebook. He edited and added a few lines. Most of his troops were 600 miles from Havana. The next few days in Havana would spell success or failure. The government could be passed on to "reformist" generals or traditional politicians. The guerillas would be forgotten.

But, "he had two advantages which were beyond the experience of the old fashioned politicians: he had an army willing to die and to kill to achieve victory, and he had the ability to ignore the military men and politicians because, via radio, he could appeal directly to the people, to gain throughout the country a mass support, the likes of which had never been seen before in Cuba"² With that in mind, Castro recorded the most important speech of his career.

Rebelde announced that Castro would shortly speak; the news spread quickly. People everywhere tuned to Rebelde and waited expectantly. In Pinar del Rio, Escalona's men halted around the Transoceanic. At 9 am came the announcement, "Now coming to the microphone of Radio Rebelde, is the supreme leader of the Cuban Revolution, Doctor Fidel Castro..."

Fidel came on, "Our troops must not cease fire... and must continue their operations on all battlefronts... The people should continue listening to Radio Rebelde and make immediate preparations to declare a general strike, if necessary, to thwart any attempt at counterrevolutionary coup..." Castro dropped his text and shouted, "A military coup behind the backs of the people and the Revolution, no! Because it would only serve to prolong the war ... No one should be confused or deceived! ... The people and the Rebel Army must

be more united and firmer than ever so as not to let slip the victory that has cost so much blood ... Revolution, yes! Military coup, no!"

Several Cuban broadcasters taped the speech and immediately reaired it. Almost everyone in Cuba heard it. The speech had the effect Castro wanted as the people fell in behind him. Across the island, the Cuban army was tired of fighting and had no idea who was in charge. As word of Batista's fall spread, thousands of machete-wielding peasants joined the guerillas. Most army garrisons surrendered to the first guerillas at their gate. The guerillas continued to arm peasants with captured weapons. If the generals in Havana played any dirty tricks, the rebels were ready to take the city.

On to Havana

Franqui's staff stayed in contact with revolutionaries around the island. Franqui remembered "Among the voices heard on the air was one called Columbia Rebelde. It turned out to be Armando Hart and Mario Hidalgo, revolutionaries who had been freed from the Isle of Pines prison and were



One translation: I support Radio Rebelde; in step with life!

at Camp Columbia (the main Havana army base). I told Hidalgo that Cantillo was a traitor. Hidalgo answered: 'Cantillo's here beside me.' I thought that would be the end of Hidalgo because there were twenty thousand soliders at Camp Columbia and fewer than twenty revolutionaries."⁴

Late that evening, Ramon Barquin, the imprisoned colonel, was released and flown to Camp Columbia. Desperate to preserve the old order, Cantillo placed Barquin in command of the army and, in effect, of Cuba. Barquin, Cantillo thought, was one of them, and his anti-Batista past could prevent a Castro victory.

The next morning the revolutionaries at Camp Columbia called Franqui and put Barquin on the radio. Franqui passed along an order from Fidel for Barquin to turn Camp Columbia over to Camilo Cienfuegos and his men, who would arrive that evening. Barquin didn't flinch; he had no plans to carry on with a lost struggle. He offered to turn the base over to Franqui right then.

Surprised, Franqui pointed out he couldn't very well command the base by radio six hundred miles away. Barquin would have to wait for Camilo. Shortly afterwards, Barquin announced on the radio he would turn the government over to Castro and place the army under Castro's new Chief of Staff, Camilo Cienfuegos.

By evening, January 2nd, Castro was in control of Cuba. Cienfuegos and 700 guerillas occupied Camp Columbia as Castro entered Santiago to thousands of cheering citizens lining the streets. Rebelde moved into CMKC's building. Elsewhere, Castro's rebels took over government buildings, police stations, and centers of communication. Batista's henchmen were captured and jailed.

Fidel left Santiago for Havana. The 600 mile road journey took a week as crowds frequently stopped him, demanding speeches. On January 8 Fidel arrived to streets of cheering supporters. The rest of Cuba watched his triumphant entry on TV or listened on the radio. At Camp Columbia he made a televised speech before a crowd of thousands. Someone in the audience released three white doves as a symbol of peace; one landed on Fidel's shoulder and stayed there during most of the speech. Finally, it seemed, freedom had come to Cuba.

The Final Analysis

Freedom was not to be, but how Castro slowly consolidated his one-man rule over Cuba and moved into the Communist camp is another tale.

If any one thing was responsible for bringing Castro to power, besides the presence of the corrupt Batista regime, it was Rebelde. Castro himself said Rebelde was worth "ten columns" of troops. Rebelde publicized the revolution. As Guevara later wrote, "When we began to broadcast, the existence of our troops and their determination became known throughout the Republic."⁵

Furthermore, Rebelde became a symbol of Batista's weakness. It "punctured the myth of

Batista's invincibility, and as a result, the station became the lightning rod for the vast majority of the Cuban population opposed to the dictatorship."¹ Radio Rebelde made Castro the center of anti-Batista forces in the minds of the Cuban people.

In the history of clandestine radio warfare, few stations compare to Radio Rebelde. Rebelde was both a voice of the guerillas to the people and a complicated network of mobile transmitters linking dozens of guerillas bands into a cohesive fighting force. Furthermore, it was successful. Rebelde is one of just a few clandestine stations that survived a revolution to become the voice of a national government.

Today, Radio Rebelde operates some of the most powerful AM transmitters in the Americas on numerous frequencies. It broadcasts via shortwave on 5025 and 3366 kHz. Why not tune in Radio Rebelde tonight, and imagine the station in its glory days ... in a mud hut in the rugged Sierra Maestra "Free Territory in Cuba."

MT

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who resorted to ingenuity in the
never-ending search for Better Reception.*

Windowpane Coupling to External Antennas

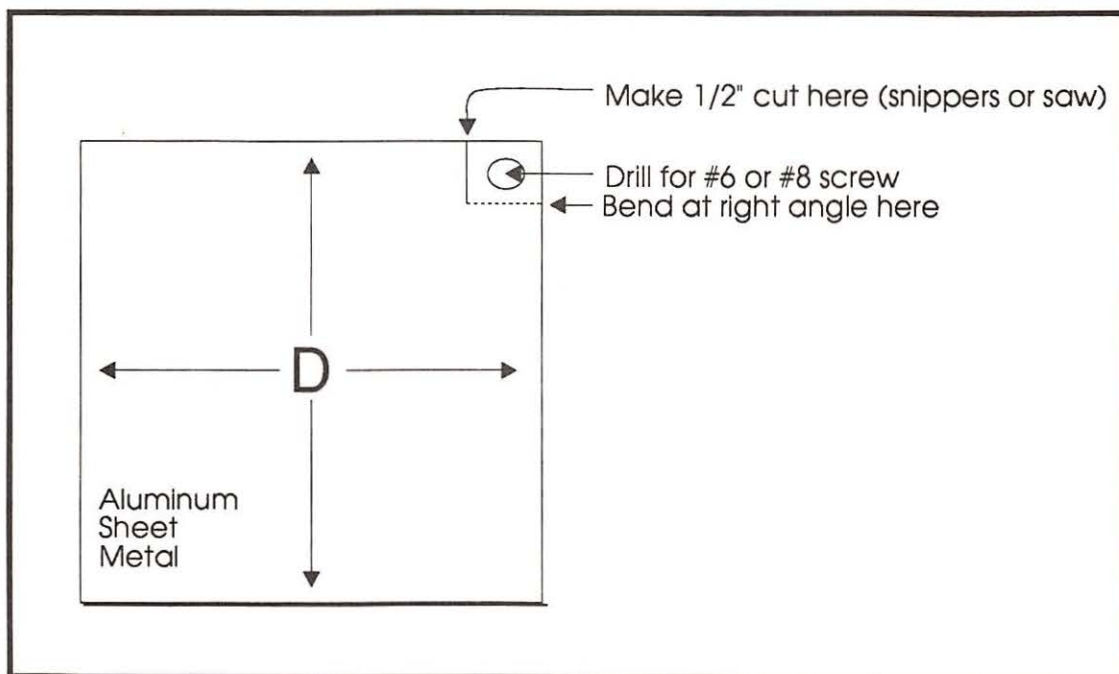
By Bill Edwards

Probably almost everyone has heard of the Windom antenna, named for its inventor. Well, this is not it; this is a "Windowpane Antenna."

I was prompted to experiment by two aspects of my experience. One is the resistance one encounters from unreasonable spouses or landlords to making a hole in a wall, floor, window, etc. to admit a lead-in from an outside antenna. The other is the fact that most portable receivers are notori-

ously susceptible to overloading, with the consequent production of spurious responses. Both of these problems are successfully addressed by using a windowpane as the dielectric coupling to an external antenna.

Figure 1



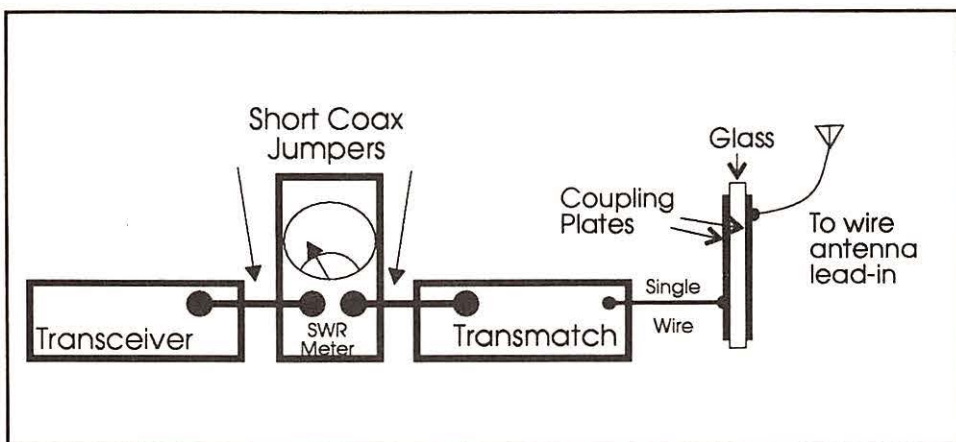


Figure 2

I have tried the methods to be described and have been extremely pleased with the results. In fact, while I was still a seagoing radio operator, I first tried the "Dielectric Coupling" through the thick (3/8"-1/2") glass of a ship's porthole. Since this is about three or four times the thickness of a normal windowpane, and adequate coupling was still obtained, I felt quite secure in the belief that with a thinner glass even better results might be possible. Experimentation has justified that optimism.

My first shore installation was for an SWL (shortwave listener) who was reluctant to drill through brick walls to bring in an antenna, or to pierce the ceiling to connect to an attic antenna. For this installation I used two aluminum squares, 3" X 3," which were formed as shown in the accompanying figure.

A hole was drilled in one corner of each plate first, then a single cut was made to enable bending it at right angles. Then, the two plates were installed, one on each side of the window at the location chosen for the receiver. Connection was made to an eaves-suspended antenna on one side, and to the receiver on the inside. It was a great success.

Upon retiring to a mountain cabin—a leased one, which prohibited any modification of the structure for radio purposes—I decided to use this method for transmission as well as reception. Here, again, I encountered the problem of thicker glass. The operating position was at a sliding patio door, with fixed glass panels on each side of it. The door glass was slightly thicker than the side panels, but even the latter were 1/4" or more thick.

Therefore, I used 6" X 6" pieces at first. I connected the transceiver as shown in Figure 2. By using a T-match tuner (coupler) I obtained excel-

lent SWR readings on all bands except 75-80 meters, even through the thicker door glass. Then I manufactured plates of 12" X 12" thin aluminum, and relocated these to a nearby (and thinner) pane. With this setup the antenna was easily matched with a tuner, even on the low end of 80 meters (around 3.5 MHz). In Figure 2, the "tuner" is a Barker and Williamson "transmatch" type, but those made by MFJ and others, or even a home-made one, will work nicely.

I was testing with a friend 400 miles distant, and my signal registered an S7 (on a scale of 10) even in the daytime. To my surprise and delight, a ham who was monitoring this activity (which had started on 40 meters) called in from Phoenix, and gave me "10 dB over S9." Thus I felt that the method was indeed good. (For thinner panes, perhaps the plates might even be a bit smaller, say 10" X 10," but I had to go with the glass that was there.)

For receive-only purposes, one should not need aluminum plates larger than three inches square. The metal should be of sufficient gauge to withstand the strain (if any) placed upon it by the outside lead-in. All my panels were attached with duct tape, but masking tape is satisfactory. If you have a better and more permanent seal in mind, you could use metal-to-glass cement, such as is used to attach rear view mirrors to windshields.

The smaller coupling capacitance used for receive-only will reduce the deleterious effects of brute-force front end overload (even from sources far removed in frequency from the desired ones, such as local broadcast stations,) that results from direct coupling of a wire antenna of much length. A receiving-type antenna tuner will greatly enhance reception results.

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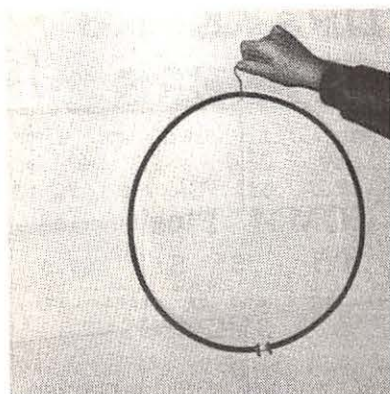
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The Amazing Circle

A Television Antenna for Tough Locations

By William Rhodes

We owned a farm in Peeples Valley, a high altitude mountain basin some 80 miles Northwest of Phoenix, Arizona. In early 1950 just after Channel 5 in Phoenix came on the air, a 12 inch TV was installed at the farm. Our 5 element Yagi antenna delivered 75% snow on the channel. Four 5-element TV Yagi stacked arrays left about 50% snow! Of course, any antenna had to look through or over Antelope Peak to 'see' Phoenix. The least snow was gained by pointing the array toward the mountain top a mile away. What a waste!

The following are some remarkable results of experiments I made with a circular antenna for television which was conceived by Ed Noll and Matt Mandl and was published in *Radio Electronics* magazine in June of 1949. Due to the precision that is required for the antenna to exhibit maximum performance, the home brew antenna seems to be limited to those dimensions that permit copper or aluminum tubing to be formed into nearly perfect circles. Practically speaking, that means the lowest achievable frequency is around that of TV Channel 3. The plane of the circle must also be flat as possible.

At first glance the circle antenna appears to have the same characteristics as a square or diamond quad, but that is where similarity ends. Copper or other tubing forms a 1-wavelength circle. It is cut for a free wavelength in space and must not be corrected for end effect.

A full wave circle was made for Channel 5's 79 MHz center carrier by forming 145.5" of 5/8" copper tubing into a near-perfect flat circle 47" in diameter. The circle is not too difficult to form if the tubing is wood plugged, filled with dry sand and plugged again to prevent kinking. The easiest method for shaping the circle is to locate a tank slightly smaller than the final circle to bend around. Junk yards are best sources for tanks.

My circle was carefully bent in the fork of a

<u>Channel</u>	<u>Circum.</u>	<u>Channel</u>	<u>Circum.</u>
2	202 inches	8	63 inches
3	183 inches	9	61 inches
4	167 inches	10	59 inches
5	145.5 inches	11	57 inches
6	135.5 inches	12	55.5 inches
7	65 inches	13	54 inches

Radio-Electronics

tree. A chalk circle was scribed on concrete for a template. This allowed for corrections in the circle plus checking the flatness of the plane.

See the accompanying table for dimensions for other channels. Channel 10, for example, is 59" in circumference, 17" diameter. This was easy to form of 1/4" copper tubing and sand loading was unnecessary.

After Ch 5 was complete, plugs and sand were removed. A short Teflon rod was inserted in both ends. The tubing ends were pushed together over the Teflon, leaving a final separation of about 1/2 inch. Bolt holes were drilled through metal and Teflon, allowing wing nuts to accept a 300 ohm ribbon. Its top center (voltage null point) was bolted directly to a 20 foot steel pole and hoisted.

As with the Yagi system, the circle faced the mountain top. Yelling myself hoarse orienting best angles, my wife commented I sounded like a frog with a man in its throat. "WOW, hold it right there—come see this—you won't believe it," she shouted. In spite of the effort put into the project, the crisp snow-free picture was unexpected.

Circle orientation vs. picture quality proved sharp lobes existed. It was moderately sensitive to rotation around its circumference, and very sensitive to XY variations.

However, in spite of the vast improvement, at random moments bright bands of snow splattered across the picture. After an hour or so, I realized auto ignition from highway 89, 1/2 mile north and crossing through the rear lobe, was responsible. Having the latest in tube fired test equipment, I decided to use passing autos for plotting the shape of the rear lobe. (Front and rear lobes are identical.)

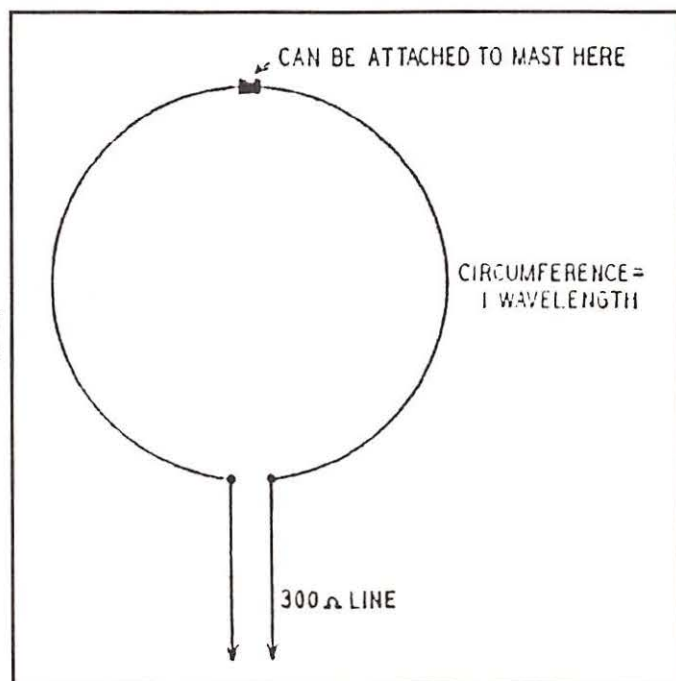


Figure 1:
Loop is a simple
1-wavelength circle.

Radio-Electronics

Answers! Answers! Answers!

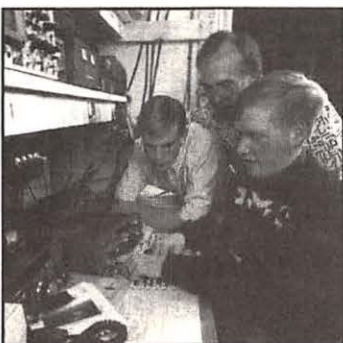
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Attaching an AM receiver tuned to the 79 MHz center of Channel 5, ignition crackle was 5 and 9—considerably louder than the TV signal. My surveyors' transit theodolite was adjusted to view the highway where autos coincided with their ignition noise on each side of the lobe. The rear lobe was precisely plotted. Total width of maximum signal at that distance was 5-6°.

With the test unit's RF gain reduced to move the S-meter into proper range, the entire width of reception level was substantially constant across the lobe. With RF gain set maximum, autos elsewhere approaching and leaving the lobe produced very low readings until within about 10° from center. As they entered the main lobe, speaker sound remained in the grass until maximum came suddenly. This is in contrast to most quad plots where major lobes appear to be about 50°.

I then made a diamond quad to test the difference. The best was slightly better than the Yagi array. Auto ignition tests were considerably lower level, but revealed lobes inherent in right angle formed quads. This suggested the sharp lobes were distorted by the quad shape. Not varying too much from the original author's description, the circle's sharp characteristics canceled multipath ghost reflections. The TV signal was ghost free in contrast to the Yagis.

Due to narrow lobes, gain is higher than a folded dipole. Similarly phased voltages induced in both sides of such antenna are canceled at the feed point. Out of phase voltages from the signal source feeds maximum signal to the transmission line. This is a full wavelength in circumference which—repeat—must not be corrected for end effect. Metal-to-metal connection can be made between pole and top center.

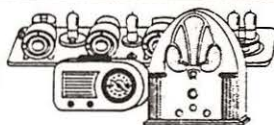
Since folded dipoles have higher Q (bandwidth selectivity) than circles, they attenuate or weaken TV sidebands. In this case, attenuation of the channel's sidebands was slight in comparison with a single element folded dipole or the Yagi arrays.

In 1964, a friend installed several stacked arrays and TV-cabled Yarnell 4 miles from our location where more signal strength was available than ours. In spite of booster amplifiers, insufficient signal threatened his business. After he viewed results of our circle, I helped him make several for his mountain. They cured the problem. Later when Channel 10 came on the air, the circle was adequate without a booster.

I have become a strong believer in such circles, and believe they could be used for satellite reception and other VHF/UHF services. It might be possible to make 4-5 element stacks for even better performance.

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Phone Cable on a Broomstick Loop Antenna

By Ray Autrey

How many of you like to climb up on the roof and shinny up trees to string wires for your antenna? How about doing that in the rain? During an ice storm? In a high wind? Nowadays, I'd rather get up there on a nice day, even though the footing is much better than some of my antenna repair jaunts in the Navy.

No, no. You aren't chicken. Even if you don't have a fear of heights, you would be a fool not to have a realistic respect for heights just as you should for electricity and power lines. There are times when it is not wise to venture up among the shingles and chimneys.

Okay, one more question. Are you a proud owner of the Sangean 803 or Radio Shack DX-440? It has an RCA-jack for an external antenna input, but the receiver very likely is used most of the time as a portable. Still, you have that nice shortwave receiver sitting there with a long whip antenna that can put your eye out and won't stay put at an angle.

When I bought my DX-440, I also went down the aisle and got one of their coax-type cables with an RCA plug on one end (and I put a VHF plug on the other end myself).

One windy, rainy night a tree limb fell across my 22-44 wire antenna and broke that sucker off right at the insulator. I couldn't listen to the Beeb, the Swiss, the Vatican; nobody but some local jerk spewing his views on what US Broadcast Radio terms a "Call-in Talk Show." I decided that I needed a "Non-Outside" external antenna. Rifling through all my junk boxes produced odd lengths of wire, but nothing suitable. However, I did find a roll of old telephone cable. Inside were six little wires with different colored insulation.

The Mother of Invention poked me in the ribs. I straightened out the roll and figured I had about 16 feet of cable, full of nice little wires that could catch a radio signal. There followed some confusion about how best to "configure" one 16-foot or

one 96-foot antenna. The room was not big enough for either, so Mother nudged me again. Why not make a 4-foot antenna with all 96 feet?

The result you can see in Figure 1. I cut the cable into 4-foot lengths and stripped off about an inch of the outside insulator on each end. I then stripped a little insulation off each of the six wires inside. It was best at that point to list the insulation colors so I could tie off each end in a sequence that would end up as one long wire. At first, I just twisted the wire ends together to see how it worked before making permanent solder connections.

I decided that three of these 4-foot sections would be enough to try out the design. That would give me a 72-foot length of VERY closely spaced folded wires.

The next question was how to mount the sections. I spotted an old broom in the corner of my work room. With a roll of masking tape, I secured the sections along the broom handle, figuring that

Figure 1: Wiring diagram of experimenter's phone cable antenna.

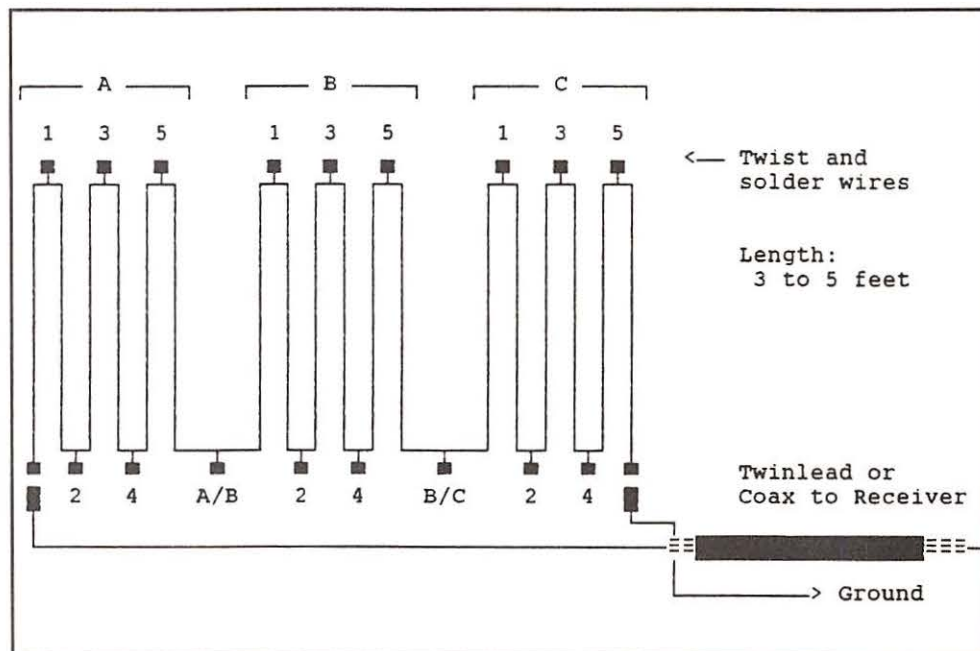
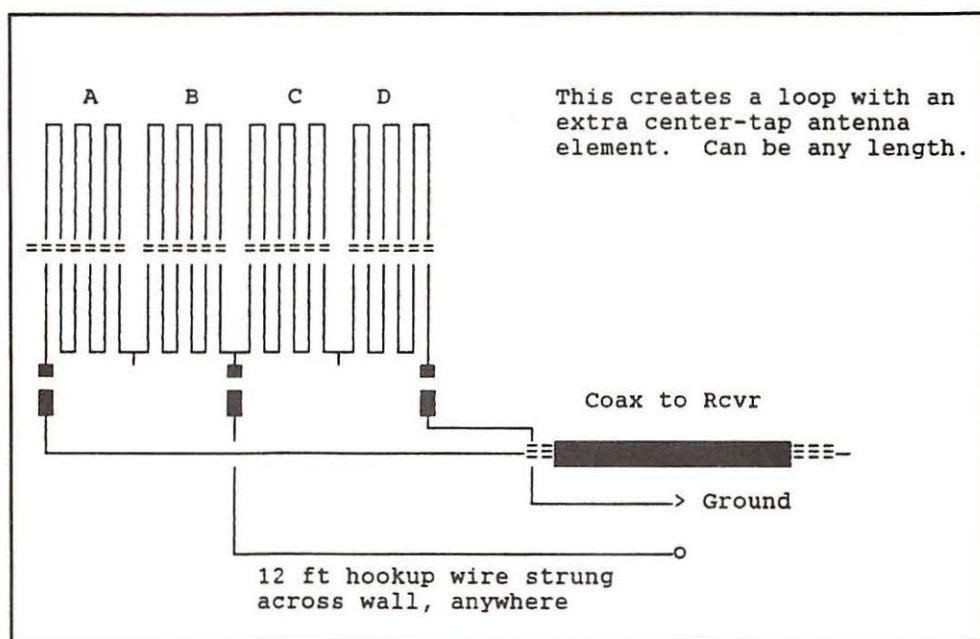


Figure 2: Alternate loop circuit with 12-foot center tap wire.



ought to work. (The broom part was eventually sawed off, by the way.)

Using jumper wires with alligator clips on each end, I connected the two free ends of the cable sections to the coax lead-in to the receiver. The broomstick was set on my workbench and leaned into the corner of the room, away from electrical and real telephone wires.

When I hit the power switch on the DX-440, the signal scale went right to the top with BBC

booming in. I still had signal after turning the RF Gain control almost all the way down. Another thing I discovered was a much quieter signal because the receiver and rod antenna were very near another receiver and a power line in the wall. The oscillators in the other radio had been radiating into the DX-440, and the power wires always have motor noise on them. The phone cable on a broomstick was four feet away in the corner.

The next few days were spent playing with the design. I found that weak stations and broadcast band frequencies were improved by connecting one wire to a good ground. I even tried clipping off at different parts of the other twisted wires. Since the wires are so close, there is almost a transformer action, but some clip-points just shorted out the signal.

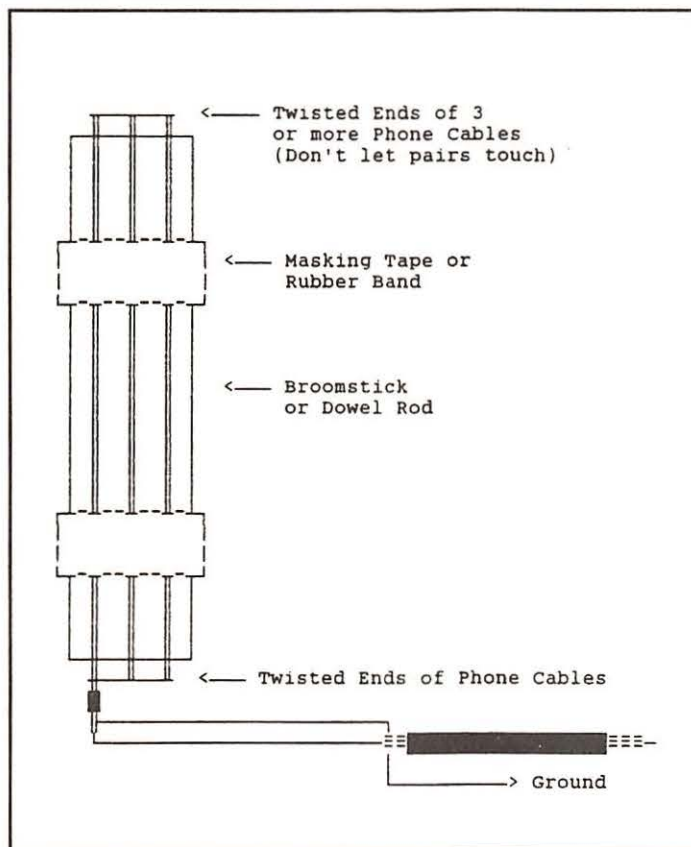
Figure 2 shows another variation that works well. I made four sections of the cable and tapped off a length of jumper wire that was handy with alligator clips on each end. The tap was at the center of the total length of wire (between B and C in the diagram). A technical person might call this an "unterminated T" segment" tap, but I guess I'd call it a "Loop-T-Loop" circuit. The experts out there could probably tell us whether, if one side of a loop is grounded, it is still a loop antenna. I just put up globs of wire and let the techies explain what they are and why they do or don't work.

By the way, this antenna can be used with any receiver, not just the Sangean. I got good results with my ICOM R-71A and a very old Radio Shack DX-150. Just use the balanced or coax input jacks.

If you want to try the experiment, the phone wire can be found in 4- and 6-conductor cable at most stores, and some places have commercial cable with 8 to 24 wires. Of course, hardware stores carry brooms or, better still, large wooden dowel rods. An eyelet screw in the top would allow you to hang the antenna from a ceiling hook. All you need is a knife to strip the wires and a thumb and forefinger to twist them.

I would caution you to use a wooden rod, but, golly, a metal curtain rod might just work, or a copper pipe, or... Whoops, I must remind myself that now *you* are the antenna experimenter. Good listening.

Figure 3: Attaching phone cables along the broomstick.



Cheap and Easy : The Accommodating Wire Antenna

By Joseph J. Carr

There are three reasons why wire antennas have remained popular amongst SWLs and hams for the entire century or so of radio history: they are cheap, they are easy to erect and they work. Ever since "Gug" Marconi stretched some wire across his father's garden in his native Italy, or wired his backyard in his adopted England, or raised a long wire with a balloon or kite in Newfoundland, wire antennas have been a mainstay for both receiving and transmitting systems. But there are several types of wire antenna that you may either be unaware of, or have overlooked in the glitz of the modern commercial "store bought" antenna.

Two Basic Forms of Wire Antenna

There are three basic categories of wire antenna: Marconi, Hertzian, and loop (Note: some texts list loops as special cases of the Hertzian).

Although the details differ from one design to another, nearly all antennas can be fit into one of these classes.

The Marconi antenna is shown in Fig. 1A. Its characteristic feature is that it is unbalanced to ground, i.e. the receiver or transmitter ("generator" in antenna terminology) is operated relative to ground and a single radiator element. The Hertzian antenna (Fig. 1B), on the other hand, is balanced; i.e. it uses two radiator elements, neither of which is grounded. Thus, if one side of the receiver or transmitter must be grounded for the antenna to operate, then it is a Marconi; if neither side is grounded then it is a Hertzian.

The horizontally polarized, half wavelength dipole is an example of a Hertzian antenna, while random length and long wire antennas are examples of Marconis. The vertical antenna, which can be made with either wire or piping, is also an example of a Marconi antenna.

The loop antenna (Fig. 1C) is similar to a Hertzian antenna in that neither side is grounded, but differs from the Hertzian in that the ends of the radiator elements are connected together forming a closed circuit.

Now that we've defined the basic categories, let's take a look at some practical examples.

Half-Size Dipole (Hertzian Antenna)

The standard dipole (Fig. 2A) is horizontally polarized, is half wavelength long, and is fed in the center. The wire radiator elements are made with #14 or #12 copper wire (either hard drawn solid, multiwire stranded, or Copperweld® in ascending order of preference). The dipole is center fed with 75-ohm coaxial cable. The classical "figure-8" pattern of the dipole is usually distorted if only coax is used, so most advanced users of dipoles install

a BALUN (BALanced/UNbalanced) transformer at the feedpoint. You can buy several varieties, but for standard dipoles it should have an impedance ratio of 1:1.

The overall length of the antenna's wire radiator element is found from:

$$L_{\text{feet}} = \frac{468}{F_{\text{MHz}}} \quad (1)$$

Where: L_{feet} is the overall length in feet, and F_{MHz} is the operating frequency in megahertz (1 MHz = 1,000 kHz). Each element of the dipole (lengths marked "A") is one-half the length of Equation [1]. It is the usual practice to cut a dipole for the center frequency in the band of interest. For example, if you want to cut an antenna for the 9.5 to 10 MHz shortwave band, then use the frequency 9.75 MHz as the halfway point. If you work the equation, you will find that the overall antenna length for 9.75 MHz is 48 feet, so each element is one-half that length, or 24 feet.

The half wavelength antenna has a bidirectional radiation or reception

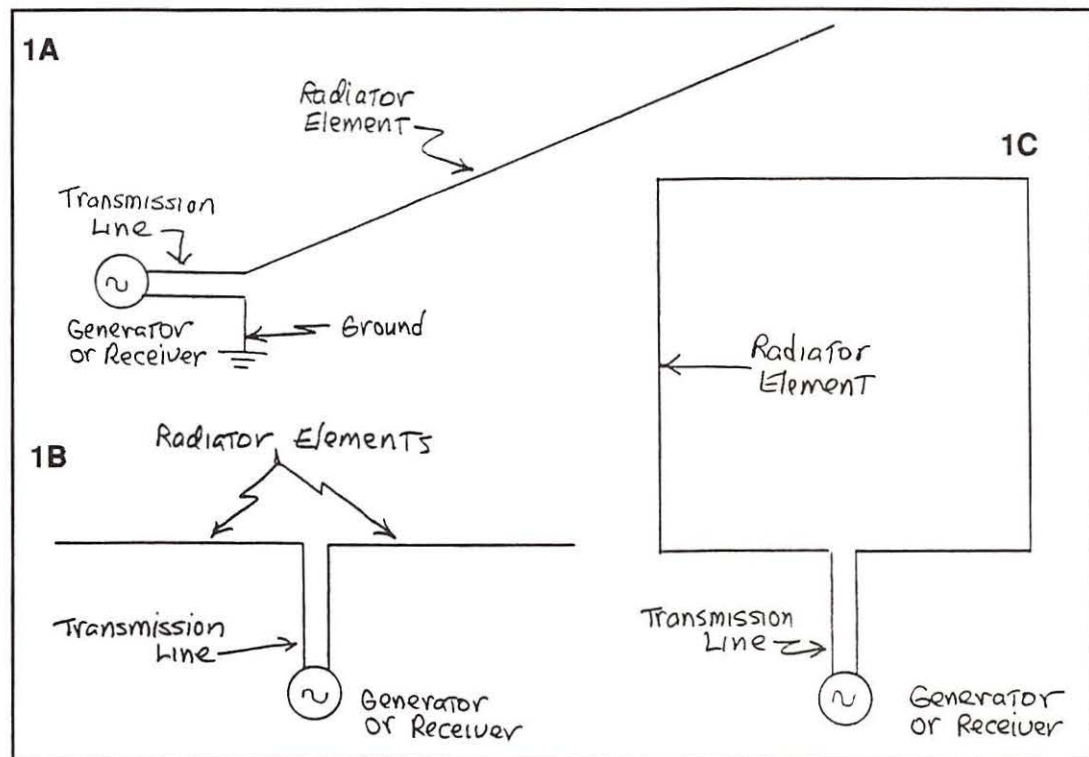


Fig. 1: A) Marconi (unbalanced) antennas; B) Hertzian (balanced antennas; C) Loop antennas.

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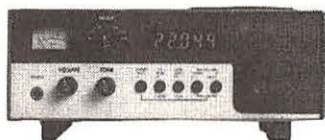
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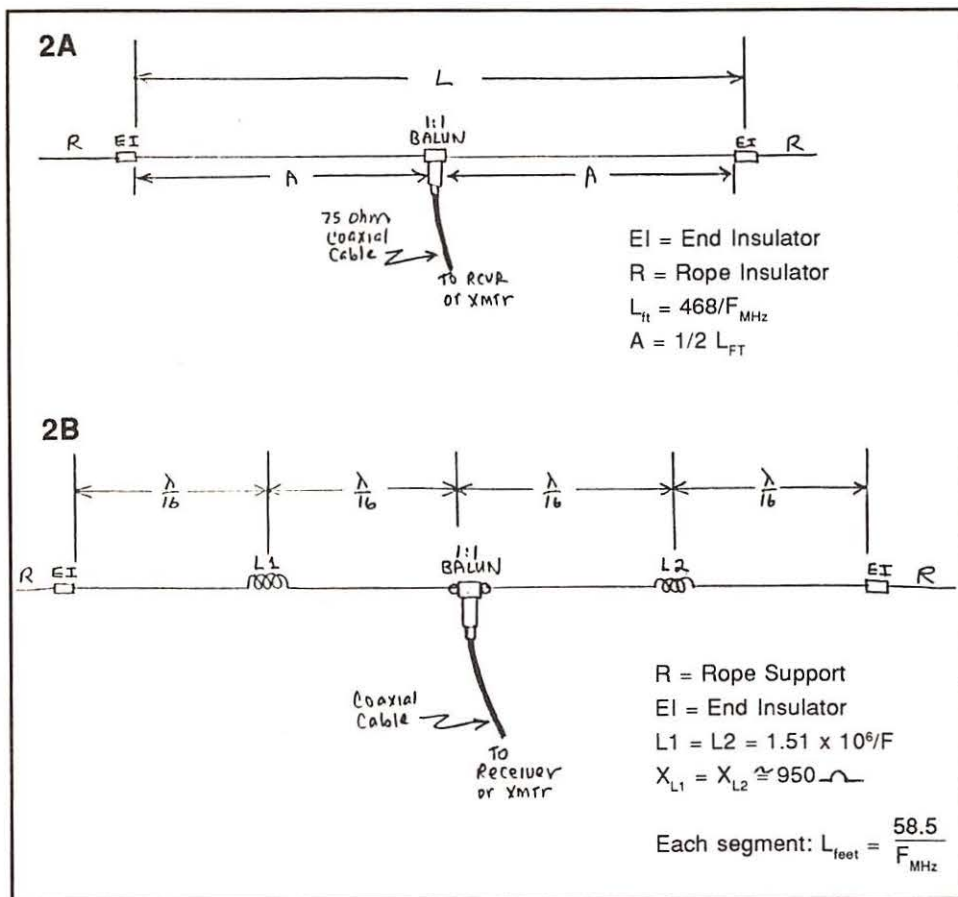


Fig. 2: A) Conventional dipole antenna; B) Half-size loaded dipole antenna.

pattern, so is good for maximizing operation in one direction, or (more importantly) nulling interfering signals from the directions "off the ends" of the antenna. But what if the antenna is too long for your property? For years I lived in houses or apartments that restricted my antenna possibilities. Even today, I can get a 7 MHz antenna (approx. 66 feet) only in one orientation, and would find a 3.5 MHz antenna impossible without the permission of a neighbor.

There is hope: the **loaded, short dipole (LSD)**, shown in Fig. 2B. Although the LSD can be as small as 10 percent of the length of a full length dipole, the half-size (i.e. quarter wavelength) LSD is probably the smallest that is practical for most people, especially since the shorter the antenna the narrower the tuning range (Q). The overall length of the antenna is quarter wavelength (as opposed to half wavelength), and it is made up of four wire segments that are each one-sixteenth wavelength long:

$$L_{feet} = \frac{58.5}{F_{MHz}} \quad (2)$$

The missing length is made up using an inductor in each leg. The reactance (X_L) of the inductor is a function of the overall length of the dipole (usually expressed as a percentage of the full-sized dipole length); for a half-size LSD the value is about 950 ohms. Make an inductor that has an inductive reactance of 950 ohms at the frequency in the center of the desired operating band. This value is:

$$L_{\mu H} = \frac{151}{F_{MHz}} \quad (3)$$

If you work Eq.[3] for 9.75 MHz, the inductance is 15.5 H. Figure 3 shows several ways the inductor coil can be installed on an antenna. Figure 3A shows one way to mount a regular "solenoid wound" coil, i.e. one that is wound in a cylindrical form with length greater than diameter. The wire element sections are tied to an ordinary ceramic or plastic end/center insulator, and tied off with several wraps back on themselves (and then soldered) for the sake of strength. The coil is hung from the insulator, or alternatively, the insulator is placed inside of the coil on the same axis. The mounting of toroidal coils is shown in Figs. 3B and 3C, and follows the same ideas as the solenoid wound coils.

The Random Length or Long Wire (Marconi Antenna)

Random length and long wire antennas (the two are sometimes confused with each other) are easily built Marconi-style antennas. They consist of a radiator element consisting of a length of wire supported by end insulators and ropes. An insulated wire download is routed through a window or wall to the receiver. If the antenna is used with a transmitter, then an antenna tuning unit (ATU) is required at the transmitter end of the download. If the antenna has an unknown length, then it is a random length and may or may not offer directivity (depending on frequency). The long wire has a length that is at least two wavelengths long (2λ), and offers directivity on the lowest operating frequency (2λ), and higher frequencies.

A **lightning arrestor** is absolutely essential on any antenna, so don't overlook it on this type of antenna! The ground terminal on the arrestor should be connected to an 8-foot ground rod that is driven into the earth, through a short length of heavy wire (consult local electrical codes).

A problem sometimes seen on long wire antennas is **static electricity** build up. The electricity comes from local fields, including distant lightning, and other physical phenomenon. It can reach hundreds of kilovolts, and can seriously damage the input circuitry of the receiver (even though not generally harmful to humans, unless you're startled by the shock and fall off your ladder).

The solution to this problem is to place a resistor between the ground and the download. Many people place the resistor across the lightning arrestor because the arrestor makes a decent mounting support for the resistor. Use a value of resistance between 200 kohms and 2 megohms. However, in constructing the resistor use at least ten 2-watt resistors in series; i.e. for a 1 megohm resistor use ten 100 kohm, 2-watt resistor connected in series. The reason for this is to prevent the static electricity from arcing over the resistor...we want to drain it off, not zap it to ground (Yes, Virginia, resistors have voltage ratings).

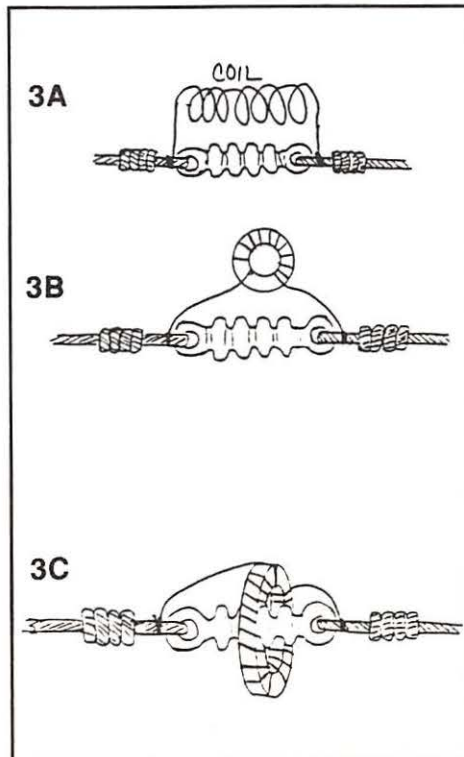


Fig. 3: Methods for mounting loading coils:

- A) solenoid wound coils;
- B) small toroidal coils;
- C) large toroidal cores.

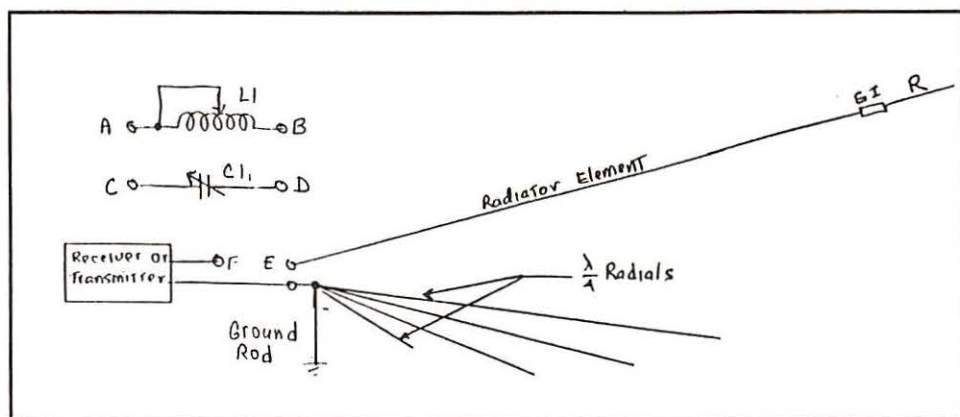


Fig. 4: Tuned random length antenna.

Tunable Random Length or Long Wire Antenna (Marconi Antenna)

The random length antenna is not usually resonant at a wide range of frequencies, but that situation can be rectified by using a tuning circuit at the feed end (Fig. 4). If an inductor ($L1$) is inserted into the circuit in series, i.e. by connecting B-to-E and A-to-F, then the antenna will act as if it were longer than the actual length (for any given frequency). Alternatively, if a capacitor ($C1$) is inserted in series with the wire, i.e. connecting D-to-E and C-to-F, then the antenna will act as if it were shorter than the actual length on any given frequency. Conversely, we can build a simple L-section antenna coupler by connecting A-to-F, B-to-D-to-E, and C-to-ground.

For the upper end of the HF region (>14 MHz) use a variable or tapped inductor of 18 μ H (or so), and a capacitor of 140 pF. For the entire range of the 3 to 30 MHz HF band, then use a 365 pF capacitor and a 28 μ H inductor (for less than 3 MHz, try up to 1100 pF of capacitance, which can be built using a two or three section "broadcast variable" capacitor).

Any long wire is enhanced by using a series of quarter wavelength radials connected to the ground point. The ground rod is also used (for lightning protection), but the radials improve the

performance on the bands for which the radials are cut. The length of each radial (in feet) is $492/F_{MHz}$. Use at least two radials for each band of interest (although, up to 120 "the more the better" ...but two to four is a practical limit). For the sake of pedestrian safety in your yard, bury the radials a few inches underground. A spade or shovel blade can be used to "slit" a trench that is wide enough to press a wire into it, without the need for digging holes.

The random length antenna can sometimes be tuned by watching the S-meter on the receiver, but the effect is small (so tune slowly and watch carefully). A better solution is to use a noise bridge, or an SWR meter (if you're licensed to transmit), to tune the antenna. Once the dials connected to the rotary inductor and the capacitor are marked for band and frequency, they can be re-tuned without the need for the instrument.

Terminated Long Wire (Marconi Antenna)

Real long wire antennas (not merely "random length" antennas) are resonant at some frequency that is set by the physical length of the antenna. A terminated long wire (TLW), Fig. 5A, is non-resonant, but is nonetheless directional. The TLW antenna is at least two wavelengths (2λ) long, but the longer the better. The directivity pattern is

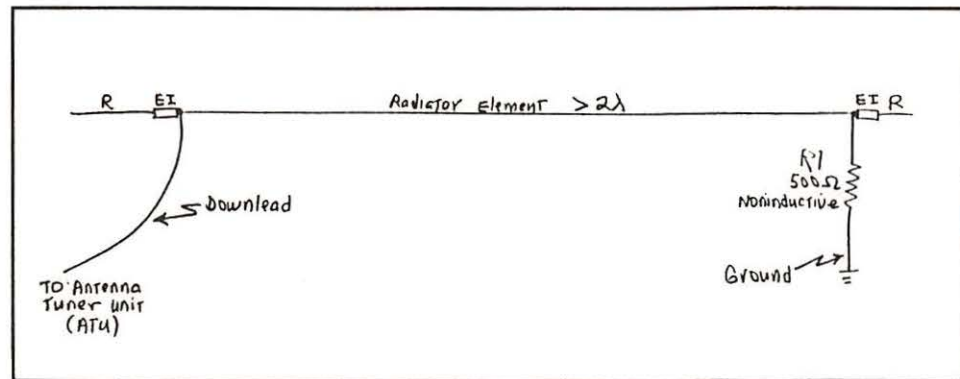


Fig. 5A: Conventional terminated long-wire antenna

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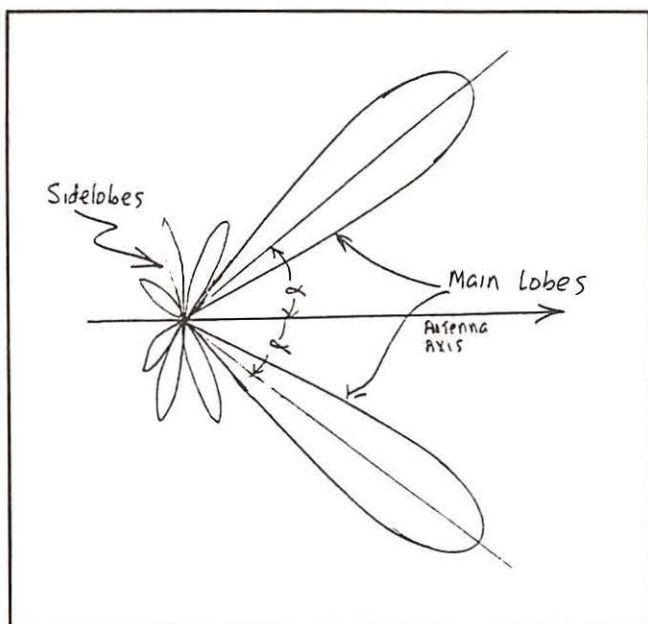


Fig. 5B: Directional pattern

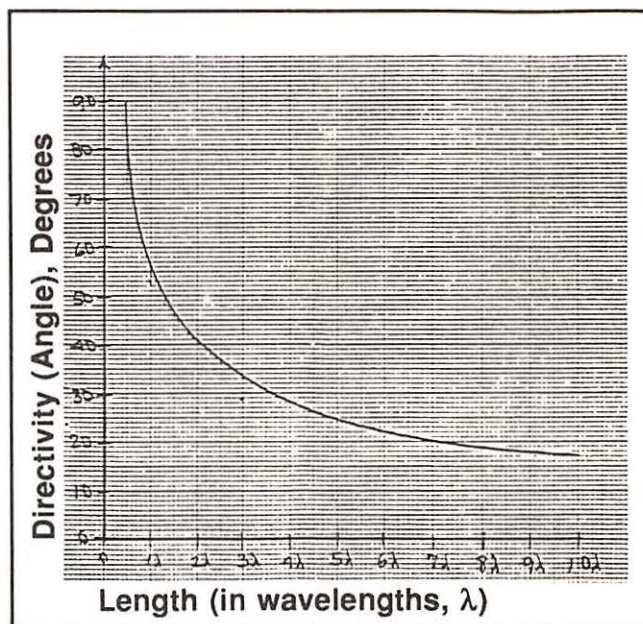


Fig. 5C: Radiation angle as a function of length (in wavelengths).

shown in Fig. 5B, while the angle of directivity (α) is shown as a function of length (in wavelengths) as shown in Fig. 5C.

The termination resistor (R_1) has a resistance that is a function of height above ground, but for practical antennas the range is normally 470 to 600 ohms. The resistor must be a noninductive type. The power rating for resistors in transmitting antennas must be at least one-half of the applied RF power, but for safety's sake use the full-power rating. For receive-only antennas, a one or two-watt resistor is satisfactory. It is reasonable to use a 470 ohm, 510 ohm or 680 ohm resistor for receive antennas.

There is a bit of a problem on practical long wire antennas: the distance from the ground to the resistor is too long for practical use when a wire must connect the two together. Figure 6A shows a practical solution to this problem: use a counterpoise ground made up of several quarter wavelength radials. The radials tend to make the antenna less "nonresonant," but that problem is overcome by using two or more radials for each band of interest. Thus, we have a non-grounded grounded antenna because of the counterpoise "ground" made with the radials. The resistor can be mounted across an end insulator, in the form shown in Fig. 6B.

Tilted, Center Fed-Terminated, Folded Dipole (Loop Antenna)

Figure 7 shows the tilted, center fed-terminated, folded dipole (TCFTFD) antenna, which is a special case of a loop antenna and a folded dipole antenna. The inventor, Navy captain G.L. Countryman (W3HH), once called it a "squashed rhombic" antenna. The antenna is a widely spread folded dipole, and is shorter than a conventional folded dipole. It must be mounted as a sloper, with an angle from its upper vertical support of 20 to 40 degrees.

The feeding of the antenna is conventional, with a feedpoint impedance close to 300 ohms. A 75-ohm coaxial cable is connected to the bottom half of the antenna through a BALUN transformer that has a 4:1 impedance ratio. At the top side of the antenna, the "feedpoint" is occupied with a termination resistor of 370 to 430 ohms (390 ohms, 1 or 2 watts, makes a good compromise for receiving antennas).

The spread (D) of the antenna wire elements is found from:

$$D_{feet} = \frac{9.8}{F_{MHz}} \quad (4)$$

The spreaders are preferably ceramic, strong plastic or thick-walled PVC pipe. The spreaders can be made of wood (1X2 stock or 1-inch dowels) for receive antennas, if the wood is properly varnished against the weather.

The overall length of the antenna is calculated a little differently from most antennas. We need to calculate the lengths from the feedpoint to the middle of the spreaders, which is also the length from the middle of the spreaders and the terminating resistor. These lengths (A_1-B , A_2-B , C_1-D and C_2-D) are found from:

$$L_{feet} = \frac{164,000}{F_{MHz}} \quad (5)$$

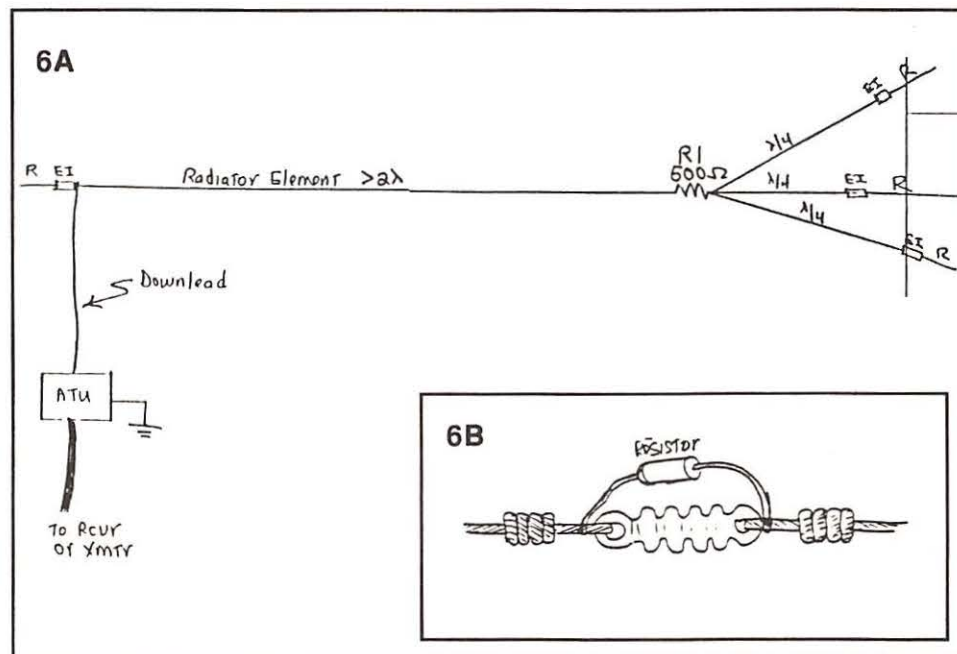


Fig. 6: A) Practical terminated long-wire antenna;
B) mounting the termination resistor for receive antennas.

Four sections of wire, each with a length defined by Eq[5], are needed to make this antenna. The lengths also must include the lengths calculated for D in Eq[4] above.

The height of the upper antenna support is determined by trigonometry from the length of the antenna from end-to-end (not the length calculated from Eq[5], but approximately twice that length), and the angle. For example, at 7 MHz the lengths are 23.4 feet, and the spreaders are 1 foot. Thus, the overall physical length, counting the two element lengths and half of both spreader lengths, is $[2 \times 23.4 \text{ feet} - (2 \times 0.5)]$ foot, or 45.8 feet. If the angle of mounting is 30 degrees, then the antenna forms the hypotenuse of a 60/30 right triangle. If we allow 6 feet for the lower support, then the upper support is:

$$\text{Height(ft)} = 6 + L \cos \phi = 6 + (45.8 \cos 30) = 45.7 \text{ ft}$$

This antenna has a low angle of radiation, and at a tilt angle of 30 degrees (considered ideal) it is nearly omnidirectional.

Loopstick Receive-Only Antennas (not loop, but Hertzian)

A loopstick antenna (Fig. 8) is a tiny, directional antenna that is built on a ferrite rod core, using a wire wrapped around the rod. Most AM and MW portable radios use an internal loopstick antenna. For the shortwave bands, use a 7 inch rod made of #61 ferrite material such as the Amidon Associates (12033 Otsego Street, North Hollywood, CA 91607; 1-818-760-4429) model R61-050-750.

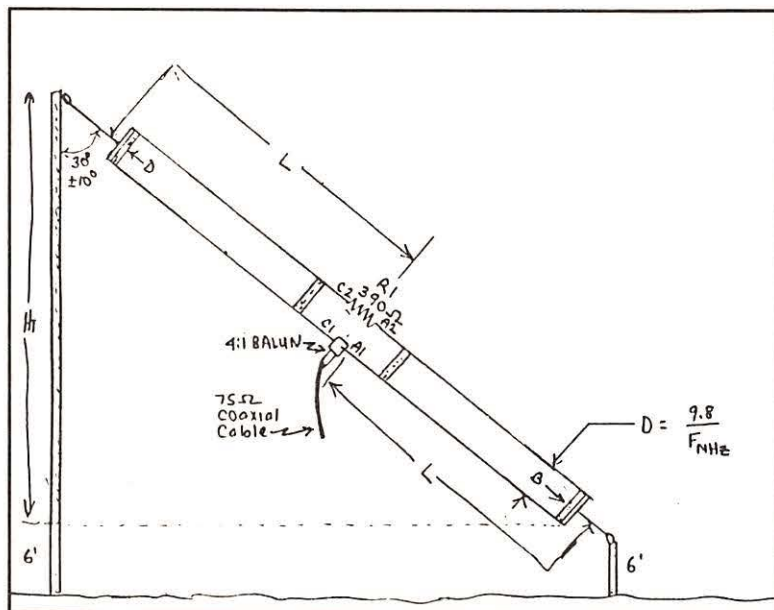


Fig. 7: Tilted center fed/terminated folded dipole loop antenna.

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Animation software for GOESTAP/WEFAX Free w/above...

Foreign orders - add \$14 shipping

Total _____

OFS WeatherFAX

604 Lakeside Court
Kinston, NC 28542
Telephone 1-800-847-4646

VISA

Wrap the entire length of the ferrite rod with a single layer of black plastic (not cloth) electrical tape; do not use "friction tape." Start at the center, and wrap #22 or #24 insulated wire clockwise until only about 1/4-inch of rod is left. Next, wrap the same number of turns from the center to the other end, but wind in a counterclockwise direction. Tie off the ends and the center with electrical tape to keep the assembly from coming unraveled. Solder the two wire ends at the center to the center conductor of a piece of coaxial cable (52 or 75-ohm); the coax shield is not connected to the antenna. If the signal level is low, then also do not connect the shield to the receiver chassis (experiment with the shield grounded and floating for best results).

The loopstick antenna can be used either indoors or outdoors, but its main use is to place a null on the direction of an interfering strong station. When you null out these powerhouse blowtorches, it is surprising what weak stations are lurking beneath them.

Conclusion

Wire antennas are a low cost, effective and simple to build alternative for both ham radio operators and shortwave listeners. They work well, and don't cost an arm and a leg. Although you can stick with the old fashioned dipole and vertical designs, these designs offer you some alternatives to work on.

M_T

More information on wire antennas can be found in J. Carr's book Practical Antenna Handbook (TAB Books, Blue Ridge Summit, PA, 17294-0850; 1-800-233-1128; Cat. No. 3270, \$21.95).

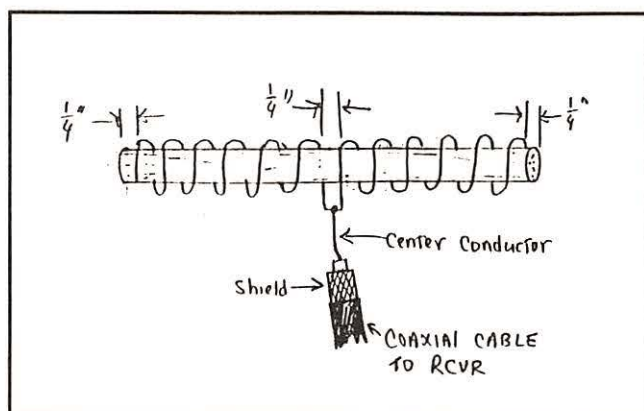


Fig. 8: Loopstick antenna.

THE NIGHT A FLYING SAUCER LANDED ON MY SCANNER!

Law Officers Confronted by a UFO

By Chuck Robertson

If you've spent a lot of time scanning, then you've probably heard some pretty strange things over the years. But when it comes to monitoring police officers chasing UFO'S, we're talking Weirdsville, USA!

Leave the space suit and anti-gravity boots in the broom closet. All you need is a scanner and an ear for out-of-this-world communications!

Strange Occurrence at Crenshaw Crossing

It was a hot summer's evening, and I was in my radio room listening to the local scanner traffic, when things suddenly began to get bizarre. On

155.07 MHz, the Williamson County Sheriff's Office dispatcher radioed her Zone 1 patrolman with an unusual request: "WC-18, we have an unconfirmed report of a UFO at Crenshaw Crossing. Will you check it out?" With a note of battlehardened skepticism in his voice, WC-18 replied, "10-4, County. I'm at Burt Willson Road. I'll be there in a couple minutes."

Crenshaw Crossing is a lonely, winding road that stretches across a moonscape of abandoned coal mine strip pits in rural southern Illinois. The area evokes an image of a prehistoric world convulsed by unseen subterranean forces. It's easy to imagine a pterodactyl circling the deep water-filled pits. Satanists are rumored to use this eerie landscape to conceal their grizzly rituals. At night, it's

especially spooky; exactly the sort of place you might expect a flying saucer to choose as a clandestine landing site.

Upon arriving at Crenshaw Crossing, the officer excitedly radioed his dispatcher: "County, there is a UFO out here!" Bewildered, all he could do was to relate what was taking place before his eyes: "The UFO is 3,000 feet wide and 2,000 feet high, and multi-colored. Looks like it's landing out in the strip pits. I'm going to try and get closer, County."

Communications went wild as state and city police joined the chase. An Illinois state trooper on 154.935 MHz made this hair-raising report: "It's hovering 50 feet above the ground and is moving away from me. I'm in pursuit!"

Radio traffic was hot and heavy as officers raced after the saucer. I've heard a lot of police chases, but nothing like this! What will the officers do if they catch the UFO? Issue it a ticket for improper lighting?

Who 'ya Gonna Call?

About 15 minutes into the chase, the Williamson County Emergency Services and Disaster Agency (ESDA) came on 155.025 MHz with a news flash. The North American Aerospace Defense Command (a division of NORAD) had just landlined ESDA and informed them that the UFO was in fact a Russian booster rocket reentering the atmosphere from a polar orbit. The rocket contained substantial traces of fuel which had ionized upon hitting the Earth's atmosphere, producing a spectacular saucer-shaped light show.

It took several more minutes for the news to filter out to all the agencies and mobile units. Some



A look at one of the strip mine pits at Crenshaw Crossing.

officers were still in hot pursuit of the UFO, while others were laughing at the absurd drama they had participated in. Eventually, everyone got word that the planet was safe from an invasion of ET's, and things returned to their normal sleepy southern Illinois pace.

Do My Eyes Deceive Me?

How could trained, professional police officers mistake a ball of ionized gas high in the upper atmosphere for a solid object so close that they actually thought it could be overtaken by their patrol cars? The answer lies in human psychology.

When confronted with tense or unusual circumstances, a person can lose their objectivity and jump to unfounded conclusions. Then, group psychology takes over and the hysteria becomes epidemic. This might be termed the Chicken Little Effect: someone yells, "The sky is falling," and everyone runs for cover!

What goes up must come down. Only about 5% of the 7,150 manmade orbiting objects that are currently tracked by the North American Aerospace Defense Command are active satellites. The rest are space junk, and they're coming our way. On average, one of these objects falls out of orbit every day.

Next time you see strange lights in the sky, take a deep breath and turn on your scanner. Check the police, emergency preparedness, and NOAA weather channels. Chances are you will discover that the UFO is space junk, meteors, aurora, Venus, blimps, mirages, or some other down to earth phenomena.

You might also try monitoring the MUFON (Mutual UFO Network) amateur radio net for updates on UFO sightings. Frequencies are 3.929, 7.237, and 28.47 MHz. The MUFON electronic bulletin board can be reached on 901-785-4943.

Out of This World Scanning

NASA's Search for Extraterrestrial Intelligence (SETI) began scanning the skies for sentient life on October 12, 1992, exactly 500 years after

MUFONET-BBS NETWORK

Electronic Bulletin Board
8-N-1 300-14,400 Baud
901-785-4943

MUFON AMATEUR RADIO NET

80 meters — 3.929 MHz
Saturday, 9 pm

40 meters — 7.237 MHz
Saturday, 8 am

10 meters — 28.470 MHz
Sunday, 3 pm

All times Eastern Time

Christopher Columbus landed in the New World. Scientists at the Goldstone Deep Space Network radio telescope complex in California's Mojave desert began setting up state of the art computerized receivers in January. Over the next ten years, the 1 to 10GHz band will be painstakingly searched for any trace of "intelligent" communications. Sophisticated receivers will listen to 32 million frequencies simultaneously and analyze each by making 100 billion decisions per second. The Goldstone site will be interconnected to other radio telescopes around the world, so that both the Northern Hemisphere and Southern Hemisphere skies can be systematically searched.

There are other SETI programs underway, but this is the most ambitious to date.

ET, radio home!

MT

*Williamson
County Sheriff's
Office received a
report of a UFO
in the Crenshaw
Crossing area.*



NOW YOU'RE TALKING!

The Code-Free Ham License is Here

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Just think how much fun you'll have communicating through repeaters, enjoy Sporadic E skip and worldwide communications on six meters when conditions are right. There's satellite communication and you can even talk to Astronauts and Cosmonauts in orbit. Enjoy friendly local communication both direct and through repeaters. Help with disaster drills and the real thing! Sound like fun? It is! Order your copy of **Now You're Talking** below: Enclosed is \$19 plus \$4 for shipping (a total of \$23) or charge \$23 to my () VISA () Mastercard () Discover () American Express

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*asterisk before/after time signifies station sign-on/sign-off;
// means parallel; +means continuing but not monitored
= 2x indicates 2nd harmonic of following frequency

ANGUILLA First of five curtain antennas for Caribbean Beacon SW was to be completed by Feb. 20. First transmitter paid for, testing December in Dallas factory (Gene Scott via Mike Fern, NASWA Journal)

ANTARCTICA? unID on 15475.82 in Spanish at 2210, perhaps reactivated LRA36 (David Clark, Ont., *Fine Tuning*)

ARGENTINA On 15780 at 1000-1130 fade, two stations in Buenos Aires on LSB for patriots in Antarctica (David Martin, Vic., *OzDX*) On same at 2225-2400, R. Rivadavia on USB, R. Mitre on LSB (Nobuyoshi Aoi, Japan, DSWCI SW News)

ARMENIA R. Yerevan reported that due to energy crisis, English newscast was being read and recorded only by the light of two candles, other languages not so lucky (BBC Monitoring)

AUSTRALIA See March; AAFR dropped the "2", expanded to an hour at 0530 on 17840; very interested in reports with SAE and 2 IRCs, to Lt. Kerry Morton, Australian Armed Forces Radio, B-4-22-N, Russell Offices, Canberra, ACT 2600. Another service may start to forces in Cambodia (Gordon Darling, PNG via John Bryant, *FT*) AAFR had one 5-minute program repeated five times during the hour with musical interludes, emotional messages (N. Takahashi, *RJMR*) Expanded to daily, mostly wives greeting husbands. One of the six Harris 100 kW transmitters at Shepparton had a small fire and was severely damaged; out for weeks if not months (Mike Bird, Radio Netherlands *Media Network*) Radio G'Day, Australian pirate was on 9150 at 0758 New Year's Eve (Paul Ormandy, New Zealand, DSWCI SWN)

AUSTRIA On RAI, still no SW *Panorama*, but DX news inserted into the Saturday mailbag segments around 0145 or 0150 UT Sunday on 9870, repeated four hours later on 6015 via Canada; on one occasion by former ASWP host David Hermges himself (gh) Tentative Z-93 schedule from March 28 has 6015 direct replacing 13730 to North America at 0000-0400, still on 9870 and 9875 (Wolf Harranth, RAI, *SW Echo* via Kirk Baxter) RAI heard on 3935 at 1955 // 13730, 5945 (W. Stienstra & M. Elbe, *Play-DX*) Guess what: 9880, also on then, minus 5945 makes 3935, a spur.

BANGLADESH R. Bangladesh, Dhaka, domestic service: 0000-0415 on 4880, 0415-0900 on 6195, 0900-1150 on 7079 and 6195, 1150-1600 on 4880, 1230-1730 on 15520; mostly Bengali but with English news at 0130, 0305, 0700, 1255, 1530, 1705 (BBCM)

BOUGAINVILLE R. Free Bougainville heard around 1000 on 3870, very poor (Arthur Cushen, NZ, *RNMN*) Believed this on 3869.7 peaking at 1100-1130, gospel music, English announcer, best on USB to avoid ham net (David Gasque, SC, *DX Daily*)

BRAZIL R. Globo turned off its 250 kW shortwave domestic service; three months later, no complaints had been received *RNMN*)

BURMA (non) V. of Democratic Burma, via Norway, 1430-1530 moved to 15180, chirp jammed (Victor Goonetilleke, Sri Lanka, *RNMN*) Audible here; Burmese intonation gives it an "indecisive" sound (gh, OK)

CANADA Two years after drastic budget cuts, RCI finally reorganizes its transmission schedule; no longer a separate service to Africa, but English broadcasts consolidated to serve several targets at once, effective Mar. 28. Many relay sites continue, but Sackville frequencies only here: 0500-0530 M-F 6150, 9750; 1200-1259 M-F 17820, 11855, 9635, 1300-1600 Sunday 17820, 11955; 1330-1359 M-Sa 21710, 17895, 17820; 2030-2129 17875, 17850, 17820, 15325, 13670, 13650; 2200-2230 15305, 13670, 11875, 11730, 9755, 5960; 2230-2359 (Sa & Su 2259) 13670, 9755, 5960; 2300-2359 Sa & Su 15235, 13670, 11940, 9755, 5960; 0100-0130 (Su & M 0159) 11940, 11845, 9535; 0100-0159 daily 9755 6120; 0200-0259 11940, 11845, 9755, 9535, 6120. This includes DST timeshifts April 4 (via Bill Westenhaver, PQ) Despite report on R. New Zealand Mar. 1 that CKFX 6080 was back on, it will not be ready until end of March, and will

initially be 10 watts again, non-directional (Jack Wiebe, CKFX C.E., *World of Radio*)

COLOMBIA Henrik Klemetz in Bogotá has located Una Voz en la Frontera, 3041, in Puerto Santander, unlicensed but in phone book, 2 x 1520.5, also heard on 4561.5 = 3x, 1005-1037 (Don Moore, IA) Back on UTC-5, judging from numerous EST time checks on CARACOL 5075 (gh)

COSTA RICA Radio for Peace International has started cooperative fundraising deals. It gets a percentage if purchasers of SW receivers from Grove write RFPI on the order. A discount long distance service also benefits RFPI; info from 1-800-234-1819 (Diane Mauer, WI) Haitian Creole program *R. Neg Mawon* has started English version, Fridays 1830, Saturdays, 0230, 1030 (RFPI *Mailbag*) Spain's relay has tried different tropical frequencies evenings, besides 4775—5050 (Brian Alexander, PA; R. Rogers, BC; Tim Gueguen, SK) 5030 (David Sharp, FL, *DXSF*) And 3940 (Diane Mauer, WI) Unsure if last was Spain direct; out of band under any circumstances (gh) Harmonics heard while in C.R.: 2560 = 2 x 1280, R. Alajuela; 2960 = 2 x 1480, R. Puntarenas (Adrian Peterson) see GUATEMALA

CROATIA (?) Believed from here on 3205.2 is R. Ustasa or Ustascha, 2250-2352* in Croatian, hard rock, folk, probably ham transmitter, drifting a lot (Roland Schulze, Germany, *FT*)

CUBA Intermittent jamming of exile SW outlets has been stepped up: LV del CID, 7340 before 1300, and 9942 afterwards, and at the same time R. Caimán on 9965; also R. Miami Internacional, 7355 via WRNO, weeknights in the 0300-0400 period (gh) A R. Havana listeners' group has set up an answering machine in Canada, 613-592-1401. Tapes shipped weekly to RHC, perhaps later direct call-forwarding; to foster communication, non-political (Roger Townsend, CA USENET via FIDO-NET via George Thurman via Kirk Baxter) Usually quick to promote electronic communication, Arnie Coro had not mentioned this weeks later on *DXers Unlimited*, probably because it was not sanctioned by the station (gh) Arnulfo Coro Alfonsín, 55, commentator on RHC, told the Boston *Globe* that Communism is at an end in Cuba, as he complained of shortages. "We must move to freer markets before the black market takes over everything, and we need political breathing room so that I can voice maverick opinions like these." (via Malcolm Kaufman)

DOMINICAN REPUBLIC The station reported on 6205.5 as R. Estrella is really R. Quisqueya, Santo Domingo, clear ID during 2350-0005 log (Santiago San Gil G., Venezuela, DSWCI via Finn Krone via *Play-DX*) Words sound similar; Quisqueya the traditional Indian name of the island.

ECUADOR HCJB's *Ham Radio Today* plans a special report on six meter band operation, Wed. Mar. 31. Dee Baklenko, hostess of *Happiness Is*, Tuesdays and Thursdays, is leaving HCJB after 30 years; swan song is Apr. 29; thank-you call-in is Sat. May 1, 0730-0830, and UT May 2 at 0230-0330, with special full-color QSL card (HCJB *Program Notes*) People from HCJB and TWR are building 100 kW SW transmitters at Crown International, Elkhart, IN. No. 4 about to be shipped to TWR Sri Lanka; five more in various stages of construction to be completed in the next year (*HCJB Today*) R. LV del Upano, Loja, new on 3360 until 0150* with radio teaching (Yimber H. Gaviria, Colombia, *Play-DX*) R. LV del Triunfo, 3249.7 until abrupt 2353* mentioned brand new transmitter (Henrik Klemetz, Colombia, *ibid.*) R. Centinela del Sur, 4770.8 until 0230* mentioning 4890; strong het from local WSMN on 4770 = 3 x 1590 (Bruce Conti, Nashua, NH)

FLANDERS RVI Z-93 from Mar. 28 shifts one UT hour earlier, like many other Europeans. English: 25 minutes at: 0630 on 5910, 9925; 0900 on 5910, 9905, 13675; 1300 on 15530, 17540; 1800 on 5910, 13685 (exc Wed. & Sat.), 15540; 2100 on 9905; 2330 on 9930, 13655. Sunday, no 0900, and 1130 not 1300; 2100 also on 5910 (Frans Vossen, RVI *Radio*)

World)

FRANCE NBFM outlets on 25710, 25900, 26070 changed from R. Neige to R. Nostalgie IDs, like the French network, from 1300 past 1700, announcements referring to ski trails, lifts, cabin sound systems (Alan Roberts, PQ, *World of Radio*)

GUATEMALA R. Izabal, from *1200 to 1230 fade on 2320 = 2 x 1160, evangelical (Don Moore, IA) The final transmitter at AWR's Alajuela site in Costa Rica, an Elcor 5 kW on 11870, is being moved to AWR Guatemala. The 10 kW on 5980 is emitting about 3 (Adrian Peterson, C.R.)

INDONESIA RRI Pontianak, Kalimantan, 3995, with Jakarta news 1300 sounds like 50 kW (David M. Clark, Ont., *DX Daily*) Great signal from new 10 kW to 1610* (David Martin, OzDX)

INTERNATIONAL WATERS V. of Friendship is new offshore station 15 miles from Java on AM, FM, and 10 kW SW 11960, on the M.V. *Friendship*, fitted out in Macau (*Caroline Movement Newslines* via WDXC *Contact*) Dubious about this (Mike Barraclough, *Contact* ed.) Me, too (gh)

IRAN (non) V. of Mojahed after 1900 jumped between 6220 and 6260 due to jamming, from Iraqi border area; is anti-religious dictatorship, was anti-Shah, and is pro-democratic, per QSL from MISS M.B., Box 9720, London, WC1N 3XX (Nobuyoshi Aoi, R. Japan *Media Roundup*)

IRAQ R. Baghdad home service a few days each near 4605, 4615, 4610, closing at 0024, opening at 0254 (Brian Alexander, PA)

IRELAND R. Stella may have taken over the R. Fax operation, after using its site. Fax carries *Reflections Europe* Sundays 1600-2300 on 3910, 6205, 12255 (David Martin, OzDX)

ISRAEL Clinton budget calls for killing the delay-plagued VOA relay project here, getting \$125 million investment back and building it in Kuwait instead (Reuter via Philadelphia *Inquirer* via Malcolm Kaufman)

ITALY Another USB feeder for RAI domestic Radio Uno is 10233.5, 2000 past 0107 // 7705 and until 2230 // 9515; news on hour but not in English (Brian Alexander, PA)

JAPAN R. Japan resumed 11865 ex-9535 March 7 at 14, 15, 17, 19 direct; many more changes April 1 for new fiscal year (Media Roundup) Doubles relays via Canada, adding 1300-1500 on 11735, 0400-0600 on 9725; usual shift for others to 1000-1200 on 6120, 0100-0300 on 5960 (via Bill Westenhaver, Joe Hanlon)

KASHMIR V. of Independent Kashmir on new 4115 ex-4080, 1530-1630, sometimes has English political commentary in first half (Victor Goonetilleke, Sri Lanka, RNMN)

KURDISTAN V. of Iraqi Kurdistan announced schedule of 1400-1700, currently on 4180v, no more repeats in the morning. R. Kurdistan announced that it would merge with V. of the People of Kurdistan, as the two supporting parties, PUK and KSP were merging. However, this was not immediately mentioned by the latter, heard as usual 1500-1636 varying 4060-4070 (BBCM)

KUWAIT R. Kuwait main program in Arabic: 0359-0500 on 15345, 0359-1315 on 9750, 0715-1315 on 15495, 1315-1755 on 21675, 11990, 1715-2310 on 9840 (BBCM) see ISRAEL

LITHUANIA R. Gintines Shvytyrys, Lighthouse of Homeland, resumed Jan. 16, Sats. 0410 on 9710 in Lithuanian; address: P.O. Box 512, 5802 Klaipeda (Arunas Silickas, Vilnius) R. Vilnius, 0000-0030 in English on 7150 via Krasnodar, costs \$10,000 in hard currency [per what?] (via BBCM) 7150 is 1000 kW from Armavir, Ukraine (WRTH 93) Summer at 2300 on higher frequency.

MACEDONIA (non) WHRI, 7315, heard with a R. Macedonia at 0100, partly in English (Diane Mauer, WI) No English, Macedonian V. of U.S., to 0130 Tue./Thu./Sat. but announced as Mon./Wed./Fri. (Richard Measham, BBCM, RNMN) Diane's tape had segment I thought was English, but so distorted and accented it's difficult to be certain (gh)

MEXICO R. Mil very active on 6010 lately, often all night or on by 1000 (Don Moore, IA, NRC *DX News*) XEW heard once on 1800 = 2 x 900 at 1217, then another on 1880, perhaps XEQ (Moore)

MONACO TWR in English Mar. 28-Sept. 25: 0640-0820 (Sun. 0845) on 9480. Frequency usage above 12 MHz: 12010, 1200-1215 Fri-

Tue. Hebrew 500 kW; 12045, 1540-1555 Tue.-Wed. Lithuanian 100 kW, 1616-1701 (Fri.-Sat. 1631) Ukrainian 100 kW; 12080, 1445-1500 Turkish 500 kW, 1513-1543 (Fri., Sat. 1528) Armenian 500 kW, 1543-1613 Farsi 500 kW (TWR) See NETH. ANTS.

MONGOLIA Around 1400 measured 4850.00 not listed 4854, and solid on 4081.15, not 4080; most reliable here in AC-free land on split LW 164 and 209 (Shel Remington, Big Island, HI)

MOROCCO VOA 15205 and RTM 15335 put +130 kHz mixing product on 15465, both Tangier (Wolfgang Bueschel, Germany)

MOZAMBIQUE A Voz de RENAMO is in Maringue, Sofala province; now legalized and getting new transmitters from Italian government. Voice phone number in Lisbon for famine aid info gets Portuguese answering machine—351-1-442-2408 (AIMnewsagency, Vito Echevarria, NY, W.O.R.)

NAMIBIA NBC says 4965 before 0500 was a test, now scheduled 0600-1600, with 3290 1600-0600, omni antenna; the N/S transmitter is on 4930 day, 3270 night (Tim Johnson, IL)

NETHERLANDS Former *Happy Station* host Tom Meijer has been honored by the Queen with a silver medal, equivalent to a knighthood, presented by the mayor of Hilversum (Pete Myers, RN)

NETHERLANDS ANTILLES After TWR closes down SW, I go on furlough to the U.S. then from 1994 to TWR Monaco frequency office, a much more crowded place (Chuck Roswell, *Bonaire Wavelengths*) Until 0125 RN heard on 5670 which is 11835 minus 6165; from 0127 on 9150, which is 15315 minus 6165 (Brian Alexander, PA)

NEW ZEALAND From return of standard time Mar. 22, RNZI drops 17770 for 15120 between 1850 and 0658 (Chuck Albertson, WA) Before timechange, BBC's *Just a Minute* heard Sunday at 0805 on 9700 (Bill Westenhaver, PQ, SPEEDX)

NICARAGUA R. Miskut, Puerto Cabezas, on new 5770 2230-2310v*, not listed 5970 (Mario Giroletti, Italy, *Play-DX*) As late as 2330 (Dario Monferini & Andrea Lawendel, *ibid.*)

NORTHERN IRELAND Riverside 101, 6238.8 at 2358 IDs, pop music, weather for Londonderry, may be relay of FM (Hans Johnson, MD)

PAPUA NEW GUINEA The head of NBC wants Pidgin to be the national language, not English; a national service in Pidgin is planned (R. Australia via BBCM) VLK, 3925, believed 2 kW, back on testing irregularly, could be regular in March; long inactive VLT, 9520, may return later this year thanks to Australian aid (Gordon Darling, PNG, via Dave Clark, FT)

PERU Total anarchy in time zones, currently UTC-4 in Lima, Chachapoyas, Puerto Maldonado, Tarapoto, Tingo Maria, Moyobamba; UTC-5 in Tarma, Huallaga, Cerro de Pasco, Iquitos, Huaraz, Huancayo, Yurimaguas (Yimber H. Gaviria, Colombia, *Play-DX*) UTC-4 except Loreto, Cusco and Puno on -5 as of mid-January (Henrik Klemetz, *ibid.*) R. Onda Verde on 4944.5 ex-4925 (K. Olofsson, SWB, Sweden via Finn Krone, AWR *DX* via *Play-DX*) 3402.5 R. Internacional is actually R. Nacional, Lima, 4 x 850 nominal, at 0938-1040 (David Valko, PA, *DXSF* via *Play-DX*) 2967 kHz station reported as Ecuador in March *MT* is El Sabor del Hombre, Cañete, Perú, 1029-1106, mentioning 1510 MW (Fernando

DX Listening Digest

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Vitoria, Venezuela, *The Radio News* via *Play-DX*)

PHILIPPINES FEBC in English: 0000-0230 (Sat. & Sun. 0200) on 15450; 0900-1100 11690; 1300-1600 on 11995; news at 0100, 1330, 1430, 1530 (BBCM)

RUSSIA FEBC, Khabarovsk, was on 4060 a while, then back to 9560, 0800-1200 in Korean (Tsutomu Kito & T. Yamashita, R. Japan *Media Roundup*) R. Nadezhda expanded FE service to 0700-1100 on 15460, also 6050 from 0900 (Y. Kato, *ibid.*) R. Ala and R. Art are off until out of debt for not paying transmitter fees (HCJB Russian service via *DXPL*) Rukhi Meroc, Spiritual Heritage from Moscow Islamic Centre, in Tatar Fridays 1600-1645 on 17890, 12075, 9620, 7155, 4055; one hour earlier in summer; phone Moscow 281-4904 (BBCM) VOA relay moved 5925 to 5915 due to jamming; also at 2200-2300, and in Korean 2130-2200 on 7300 Petropavlovsk-Kamchatsky, 250 kW, 244° (Bill Whitacre, *RJMR*, and Dan Ferguson, *SW Echo* via Kirk Baxter)

SAIPAN KHBI went off Jan. 2 to install new solid-state "controlled carrier" modulators on the two 100 kW Continentals, resulting in 40% energy savings; back on with one Jan. 21, the other Jan. 22. This upgrade converts the 418-D transmitters into the new 418-E model (Ed Evans, *WSHB*) Z-93 sked started March 2; KHBI-1: 0400 17780, 0800 17555, 1000 13625, 1800 9355, 2000 9455, 2200-2400 13625; Sat./Sun. 0000-0400 17865. KHBI-2: 0600 17555, 0800 15665, 1000 17555, 1200 9425, 1400 9530, 1600 11580, 1800 9430, 2000 13840, 2200 15405, 0000-0200 17555; Sat./Sun. 0200-0600 17555 (*WSHB*) Only English from KFBS is to Russia, 1930-2000 on 9465 (BBCM)

SAUDI ARABIA (non) V. of the Free Men of the Peninsula "from Riyadh," from before 2230 to 2256 on 11860, believed from Iraq (BBCM)

SENEGAL ORTS, 7170.2v at +1900-0100* and *0600 in French, vernaculars; nice clear ID at s/on, Sénégal anthem at s/off. Tough thru VOA and other QRM, but in clear after 0000 (Bob Hill, MA)

SERBIA R. of Bosnian Serbs, 5-min program on R. Yugoslavia, 2125 on 9720, 6100, 0055 on 9680 (BBCM via *RNMN*) Actually 9580 at 0051; may make 30- or 60-minute shift for DST (gh)

SEYCHELLES FEBA English until May 1: 1500-1555 (Sun. 1558) to S. Asia on 11710; different *Network* "International" program 1500-1600 exc. Sun. 9810, 15330. Friday only to Mideast 0500-0608 on 17750 (FEBA)

SIKKIM AIR Gangtok, 4775, *DX* news 0030, fade at 0100 sunrise, tentative, testing (David Clark, Ont., *DX Daily*) Some days it's Guwahati instead (Roland Schulze, Germany, *FT*)

SLOVAKIA Slovak Radio plans new external service from April 1, including English: 0930 to Australia 11990, 9505, 7345; 1830 Europe 7345; 0000 America 9580, 5930; 27 min. ea. (BBCM)

SOMALIA The R. Mogadishu supporting Ali Mahdi Muhammad announced news in English at 1415. Varies 9200-9600 or 6958-6963, one at a time (BBCM) R. Rajo (Hope), 9540, not heard for ten days at 1100 following Feb. 15 (Richard Measham, BBCM via *RNMN*)

SPAIN RNE-RE has weekly Sephardic service, Thu. 1945-2015 to Mideast on 9580, UT Fri. 0235-0255 S. America on 9620, 0415-0435 N. America on 9690 (*Amigos de la Onda Corta*) Antique Spanish quite comprehensible to modern speakers, nice Jewish music (gh)

SUDAN R. Omdurman has begun verifying, thanks to new man in charge, Mohammed Elmahdi Khalil (Sheryl Paszkiewicz, WI) National Unity Radio on 9165 in Arabic at 1535, ex-9170 which was co-channel China; should be clear for English at 1500 (Bruce MacGibbon, OR, *RJMR*) It is, tho China never a problem here; timesignal up to a minute late (gh, OK) Radio SPLA back in early Feb. after 4-month break, 0500-0530 English, then Arabic on 9190, hostile to Khartoum government. Also colloquial languages, from 0430, alternate frequency 9170 (BBCM)

SWAZILAND TWR English until May 1: 0430-0535 7215, 0430-0600 7200, 0430-0700 5055, 0600-0820 (Sat., Sun. 0835) 11740, 7200, 1600-1700 9500, 1700-1730 9525, 1800-1815 9500, 1800-2015 3200, 1900-2045 3240, 2015-2045 Sun. 3200 (Via Wolfgang Bueschel, Germany)

SWEDEN Sweden Calling *DXers* emphasizing Nordic satellite news was management decision, not my idea. Founder Arne Skoog is devastated

at direction the program has taken (George Wood) Wish for my 80th birthday: to have *SCDX* back with shortwave news (Arne Skoog) Listeners should make objections known to the station (Ian McFarland, all on *RJMR*)

TAIWAN (non) From Mar. 28, one VOFC English relay via WYFR makes seasonal change, 2200-2300 on 21720, 17750 to Europe (WYFR)

THAILAND VOA Udon planned to test for one year from March 1, only at night allowing antenna work in daytime. Initial schedule, Chinese program: 1100-1400 11785, 1400-1500 9615, 1500-1700 9680, 2100-2300 6045. Special QSL, American reports welcome (John Vodenik, VOA)

TONGA TBC's 5030 off the air due to lightning, should be quickly reactivated for Tongan emigrés in Hawaii, U.S. mainland, New Zealand and elsewhere (Richard E. Wood, HI, *W.O.R.*)

URUGUAY R. El Espectador, 11835.7, 500 watts, heard from around 0130 until VOA covers at 0300 (John H. Cobb, GA)

USA WWCR is the 20th largest shortwave station in the world in terms of program hours per week, ahead of Australia, Vatican, Cuba, Spain, Switzerland, Bulgaria (BBCM via *RNMN*) Yes, but this survey ignores number of transmitters (gh) WWCR #3 has been assigned 5810 and 15610 kHz, expected to start April 1 (George Thurman, IL) That should bump WWCR up a few notches (gh) Contrary to *PopComm* item, our Ethiopian programs say they are *not* connected with clandestine broadcasts from Russia (Adam Lock, Sr., WWCR) A *View from Europe* moved to Sun. 1600 on 15685; by late Feb. after numerous repeats, *Signals* and *Radio Techniques* had vanished from WWCR, and *Radio New York International* feared it was on borrowed time. All programs shift one UT hour earlier for DST from April 4; aside from further permanent changes, *WORLD OF RADIO* would air at: Fri. 2115 on 15685, UT Sun. 0305 and 0700 on 7435, 2300 on 15685, Mon. 1230 and Tue. 1130 on 15685; via WRNO, Sat. and Sun. 2030 on 15420, UT Sun. 0200 on 7355.

GH's DX DAILY ran successfully in Feb., may come back in April as a 10-minute program at earlier hour, such as 0130 on WHRI 7315, or on WRMI 9955 or on WWCR (gh)

A terrible accident at WHRI: engineer Larry Fawbush electrocuted while working in a transmitter (Jeff White, FL) Tax fines are mounting on Pastor Pete Peters' church property in Colorado for unauthorized political usage; he may lose it (Denver *Post* via Bob Weller) But he expanded to UT Mon.-Sat. 0300-0400 on WHRI 7315, *Scriptures for America* (via Diane Mauer) Dedicated to gay-bashing, like Bro. Stair whom he replaced. (gh) Besides Macedonian program (*q.v.*), WHRI other nights at 0100 had a *Radio Bosnia* from San Francisco, partly in English (Mauer)

KGEI, 15280 has one English program, Sun. 2200-2230 (BBCM) Not in *WRTVH*; it's Billy Graham, until 2235 (gh)

WJCR is registered for 17525 during DST at 1500-0100, 50 kW, 55° to E. Canada, Europe (FCC via White)

Not on FCC list, but WEWN plans 7425, 500 kW due west at 2200-0700 during Z-93 (via George Jacobs) First-day QSL for Dec. 28 arrived Feb. 22, signed by Gary L. Gagnon, my barber's nephew. Said they hoped to have other three transmitters on by March 1. As a practicing Catholic, I agree with gh that WEWN would be too boring even for Catholics unless they add lay programs (Edouard S. Provencher, Biddeford, ME) Still only one heard that day. KJES, NM, still silent through Feb. (gh)

VOA *Communications World* moved Sat. from 1710 to 1610 (Joel Rubin, Edwin Southwell) Best on 19379 LSB (gh) Most Bethany SSB cancelled, 19261.5 and 15752 USB, just 10869 left for German 2200-2230. Two new people hired in Washington to answer reports from American citizens, new QSL policy; I help too (John Vodenik, VOA-BY) Another time for *VOA Editorials* is UT M-F 0356, such as 7405, which has also been added for Somali 0245, 500 kW Greenville (gh) Clinton budget plans to close RFE/RL by 1995, turn over assets to VOA (via Malcolm Kaufman) CPB, funder of NPR & PBS, suggests it should control VOA (*NY Times* via Chet Copeland)

Portuguese religion heard Sunday 1224 on 2580; it was 2 x 1290, WRCP, Providence, RI (Diane Mauer, WI)

Until the next, best of DX and 73 de Glenn.

Broadcast Loggings

Thanks to our contributors — Have you sent in YOUR logs?
Send to **Gayle Van Horn**, c/o Monitoring Times.
English broadcast unless otherwise noted.

0025 UTC on 15575

SOUTH KOREA: Radio Korea. Interval signal and frequency quote. International news and feature program, *Origins of Korean Science*. (Ed Rausch, Cedar Grove, NJ)

0054 UTC on 7705 kHz USB

ITALY: RAI. Italian/English. Possible station feeder monitored to 0205, and 0258-0305. Primarily ballads and instrumental music to time pips before the hour. Italian newscast to ID pronounced as "rye." English news segment which seems parallel to Radio Uno with news, no French or German. No parallel frequencies noted, some fading. (Mike Hardester, Jacksonville, NC)

0108 UTC on 11710

ARGENTINA: RAE. English programming to North America. Comments on QSL policy, and frequency quotations. (Loy Lee & the Maywoods DX Team, KY) Additional monitoring on 6060 kHz at 0730. (Rausch, NJ)

0110 UTC on 3300

GUATEMALA: Radio Cultural. Religious music on piano to announcers ID. Radio Tezulutlan heard on 4835 kHz at 0135. (Maywoods DX Team, KY)

0116 UTC on 9735

PARAGUAY: Radio Nacional. Spanish. Program on the music of Paraguay, interviews with composers. Very strong, no fading. (Dave Frenz, Milwaukee, WI)

0129 UTC on 4830

VENEZUELA: Radio Tachira. Spanish. Station ID to popular music and chat. Two additional Venezuelans noted as; Radio Valera on 4840 kHz at 0142, and Ecos del Torbes on 4980 kHz at 0249. (Maywoods DX Team, KY)

0137 UTC on 4759

PERU: Radio Tinga Maria. Spanish. Peruvian vocals to male announcer's talk and ID. (Maywoods DX Team, KY) Peru's Radio El Sol monitored on 5969 kHz at 1045. Fair signal for news, time check and ID. (GVH)

0200 UTC on 4879.6

ECUADOR: Radio Nacional Espejo. Spanish. Announcer with numerous ads, IDs and music jingles. Abrupt power disruption at 0204. Radio Quito monitored on 4920 kHz at 0235. (Maywoods DX Team, KY)

0204 UTC on 4910.74

HONDURAS: La Voz de la Mosquitia. Religious programming with special messages to friends in Kentucky. Very nice signal. (Frenz, WI) La Voz Evangelica heard on 4820 kHz at 0312. (Maywoods DX Team, KY) (Thomas Banks, Dallas, TX) (Sam Wright, Biloxi, MS)

0240 UTC on 5700

PERU: Radio San Ignacio. Spanish. Music mix of Latin pops and 70's disco tunes, to IDs and 0330*. (Rausch, NJ) Peru's Radio Cora heard on 4914.55 kHz at 1039. IDs and world news update. (Rausch, NJ)

0255 UTC on 3279

MOZAMBIQUE: EP de Sofala. Portuguese/Vernaculars. Music, signal clock chimes at 0300. Portuguese news, tribal music to 0315. Mentions of Mozambique to fanfare and vernacular discussion. (Jerry Witham, Keauu, HI)

0259 UTC on 5055

COSTA RICA: Faro del Caribe. Spanish. Clear station ID at 0259. Regional music and chat. Costa Rica's Radio Reloj heard on 4831.5 at 0529. (Maywoods DX Team, KY) Radio For Peace Int'l heard barely on 15031.5 kHz at 1726. (Harold W. Bower, Sunbury, PA)

0259 UTC on 5075

COLOMBIA: Caracol Colombia. Spanish. Great signal! Music, IDs, jingles, and extended news on Medellin. (Maywoods DX Team, KY)

0303 UTC on 4935

KENYA: Kenya BC. Local news program at the hour, followed by music program of African hit to US pops. Signal far better than their average signal. (Frenz, WI) Jazz program audible this frequency at 0230. (Maywoods DX Team, KY) (Banks, TX)

0330 UTC on 3249

HONDURAS: Radio Luz y Vida. Spanish. Local interest news items to music instrumentals. Station ID/frequency quote to national anthem and 0355*. (Frank Hillton, Charleston, SC) (Wright, MS)

0345 UTC on 3230

SOUTH AFRICA: Radio Orion. English/Vernaculars. Announcers time check, "sixteen minutes to 6:00 o'clock in the morning." Pop records and multilingual announcements to ID and Rothmans cigarette commercial. (Witham, HI) (Maywoods DX Team, KY)

0355 UTC on 7417.5 USB

PIRATE: Voice of the Plains (Tentative). Possible ID at tune-in, with mention of Wellsville mail drop several times. Three segments of live phone calls to chicken/cows sound effects. Mention of "Pirate Air Field" and phone number quote. Very poor signal level. (Hardester, NC)

0405 UTC on 3270

NAMIBIA: Namibian BC Corp. News on Kenya and outbreak of cholera in

Zimbabwe. More African news to 0418 and local news at 0430, weather and tide schedules. Continued news to signal fade out at 0440. (Witham, HI)

0510 UTC on 4959.8

DOMINICAN REP.: Radio Cima Cien. Spanish. Lively Caribbean music from unassuming male DJ. Station ID at 0532. Tentative logging until a station ID was heard during tape play back. (Witham, HI)

0521 UTC on 4770

NIGERIA: Radio Nigeria. National news topics to news on Lagos. ID and phone number quote as "843-040". Nice signal. (Hillton, SC)

0605 UTC on 5047

TOGO: Radio Lome. French. Announcer chat to ID and extended newscast. Nice signal. (Maywoods DX Team, KY)

0615 UTC on 7415

PIRATE: Jolly Roger Radio Int'l. "The Hits R Us, We're Jolly Roger Radio International." DJ noted he was broadcasting in AM stereo. Song and station sign-off at 0633. (Witham, HI)

0617 UTC on 6185

MEXICO: Radio Educacion. Spanish. Non-stop of US pops. Clear station ID as, "aqui...Radio Educacion..." Good signal quality. (Hardester, NC)

0630 UTC on 5930

RUSSIA: Radio Murmansk. Russian. Domestic service with announcers talk and news. US and British rock music. (Rausch, NJ)

0720 UTC on 5097.3

PERU: Radio Eco. Spanish. Strong signal but excessive interference from CW station. Subsequent monitoring the next evening at 0230. Peru's Radio Atlantida heard on 4790 at 0900-0955. Rooster wake up calls, community announcements, and frequent station IDs. (Frenz, WI) (Rausch, NJ)

0750 UTC on 3385

PAPUA NEW GUINEA: Radio East New Britain. Pidgin/English. Talk and regional music and news. PNG's Radio East Highlands heard on 3395 kHz with similar program format. (Maywoods DX Team, KY)

0805 UTC on 7170

SENEGAL: ORT du Senegal. French. Numerous mentions of Senegal and regional Senegalese music at 0813. Signal buried by station believed to be Radio Moscow at 0818. (Witham, HI)

0812 UTC on 6180

BRAZIL: R Nacional Amazonia. Portuguese. Sign-on interval signal, ID and time check. *Hora De Musica Brazilian*: pops and ballads. Excellent signal! (Rausch, NJ) (Wright, MS)

0845 UTC on 15450

AUSTRIA: Radio Austria Int'l. Asian service with mailbag program. News and station IDs to German service at 0855. Fair signal. (Rausch, NJ)

1020 UTC on 4976.5

COLOMBIA: Ondas del Orteguzza. Spanish. Terrific guitar ballads at tune-in. Local news. Colombia's Radio Buenaventura heard weakly on 4833 kHz at 1030. IDs noted for station and the Caracol radio network. (Hillton, SC)

1340 UTC on 9615

INDIA: All India Radio-Bombay. Vernaculars. Weak signal for music to ID at 1345. Tentative logging for AIR-Bhopal on 3315 kHz at 0120. (GVH) AIR-Bangalore heard on 11620 kHz at 1746. Announcer in English to drum instrumentals. Females' station ID at 1800. (Maywoods DX Team, KY)

1430 UTC on 11700

GUAM: KTWR. Fair signal for religious programming of sermon, choral hymns, and station ID. (Hillton, SC)

1615 UTC on 9515

CANADA: BBC Relay. *Europe at the Time* profiling Europe in 1914. (Bob Fraser, Cohasset, MA) Radio Canada Int'l heard on 15325 kHz at 2005. Farming news and weather forecast. (Bower, PA)

1710 UTC on 4891.1

PAKISTAN: Radio Pakistan. Pakistani. Discussion and voice overs during regional music. Western-style pop music at 1715 to "Radio Pakistan" ID at 1720. (Witham, HI). Audible this time on 9418 kHz. (Rausch, NJ)

1906 UTC on 11920

MOROCCO: RTV-Marocaine (Tentative). French programming monitored to 2005. Classical and pop music tunes monitored on several days. No definite ID and moderate fading. (Hardester, NC)

2025 UTC on 7465

ISRAEL: Kol Israel. *DX Corner* with profile of the Lowe HF-150. Parallel program heard on 9435 kHz. (Fraser, MA)

2045 UTC on 4830

BOTSWANA: Radio Botswana. Male announcer hosting pop music program. (Maywoods DX Team, KY) VOA-Botswana heard on 15495 kHz at 2020. News on Clinton administration. Very weak signal. (Bower, PA)

2138 UTC on 6085

GERMANY: Bayerischer Rundfunk. German. Music by Bernstein and Hillard. "2159 by WYFR almost obliterated BR's signal. During the WYFR interval signal, noted 30-35 seconds of time pips, a slight pause, and a "Bayerischer Rundfunk" ID into a German news report. Fair/good until WYFR dropped in! (Hardester, NC)

2330 UTC on 9445

TURKEY: Voice of Turkey. Program *What's Up in Turkey* featuring domestic news items. (Fraser, MA)

Utility World

Larry Van Horn

c/o MT, P.O. Box 98
Brasstown, NC 28902



Maritime Monitoring

'Tis the season...now before you jump in there fists a-flying, let me finish... 'Tis the season (at least, here in North America), when folks start getting back into their boats and motoring the waterways.

'Tis also the season for violent weather. As spring takes hold and winter slowly fades away, it triggers one of nature's most violent of events that most boaters know only too well — thunderstorms. These titans of nature pose a major threat to both boats and ships. With the advent of some new technology, weather warnings and forecasts are now available to boaters and the maritime community in written form. I am talking about the data signals some of you may have heard on 518 kHz, called NAVTEX.

NAVTEX is an international standard method of receiving Notices to Mariners and marine weather forecasts using small, low-cost printing receivers designed to be installed in the pilothouses of vessels. The International Marine Organization (IMO) has amended the International Safety of Life at Sea (SOLAS) Convention to require all ships of 300 tons and larger on international voyages to carry NAVTEX receivers by August 1993.

The NAVTEX system is of real benefit to mariners who do not have a knowledge of Morse Code. It also suits itself well to those vessels not able to man their radios on a 24-hour basis in order to hear critical warning messages. With a NAVTEX system on board mariners will no longer find it necessary to listen to, or sift through, a large number of non-relevant data to obtain the information necessary for safe navigation.

Several types of information are broadcast by NAVTEX stations. These include but are not limited to:

- Broadcast Notices to Mariners
- Coastal Weather Forecasts
- Coastal Marine Advisories and Warnings
- Search and Rescue Information
- Electronic Navigation Information

These transmissions use the SITOR-B or FEC mode of transmission. A typical message is the one below:

ZCZC OE12
TTAAOO KPDJ 121622
Coastal Waters Forecast
National Weather Service Portland OR
8:30 AM PST THU MAR 12 1992
Clatsop Spit to Point St. George...out to 60 miles

...Synopsis...Weak high pressure inland and just offshore today with low pressure centered 700 miles offshore. The low will move northeastward with its associated cold front approaching the coast late Friday.

ORZ501-122230-
Clatsop Spit to Point St. George...out to 60 miles
8:30 AM PST THU MAR 12 1992

...Small Craft advisory for swells...Wind North to Northwest 5 to 15 knots...

The ZCZC in the header is the teletype indicator used to identify a new message to teletype equipment. Each NAVTEX message broadcast contains a four-character header:

First Character	Station Identification (O in our example)
Second Character	Message/Subject Content (E in our example)
Third/Fourth Character	Message Serial Number (12 in our example)

This type of header allows the microprocessor in NAVTEX receivers to screen messages from only those stations that are relevant, subject categories needed, and messages not previously received by a particular user. Screened messages are printed on a small roll of paper as they are received by a shipboard terminal, to be read by mariners at their convenience. All other messages not selected or previously read will be suppressed.

The following is a complete list of the latest Message/Subject identifiers used on NAVTEX systems (second character).

- A Navigational Warning
- B Meteorological Warning
- C Ice Report
- D Search and Rescue Information
- E Meteorological Forecast
- F Pilot Service
- G Decca Message
- H Loran C Message
- I Omega and Differential Omega Message
- J SATNAV (Satellite Navigation) Message
- K Other Electronic NAVAID (Navigation Aids) System Messages
- L Navigation Warnings (Additional to A)
- M-U Not yet defined
- V-Y Special trials (e.g.-Non English broadcast)
- Z No message on hand (QRU)

All NAVTEX transmissions are made on 518 kHz. You do not have to have a NAVTEX receiver to copy these broadcasts. Anyone equipped with SITOR mode receiving equipment can receive them by using the FEC (Forward Error Correction) mode and tuning to 518 kHz.

Table 1 is a list of stations known to be broadcasting NAVTEX signals on 518 kHz. As always, I would appreciate any additions or corrections to this list you might have. Send them to me in care of MT. Gee, is that thunder I hear outside right now?

Major US Coast Guard Change in August

In a related story to this month's NAVTEX feature, on August 1, 1993, the United States Coast Guard will discontinue all watchkeeping on the International Marine Distress frequency of 500 kHz. They will also cease all Morse code services in the medium frequency (MF) radiotelegraphy band. This change affects all Communications stations and Coast Guard cutters.

The official notice received from the Coast Guard says that, "more efficient telecommunications systems are now available to provide mariners with options for initiating or relaying distress alerts plus the passing and receiving of Maritime Safety Information."

Some of these options include INMARSAT (International Marine Satellite), Radio Telex (SITOR), MF/HF (Medium/High Frequency) Single Side Band (SSB) and VHF (Very High Frequency) Radiotelephone, and Satellite EPIRBs (Emergency Position Indicating Beacon System) for distress alerts and telecommunications. INMARSAT Safetynet, NAVTEX and HF NAVTEX (SITOR) will be able to provide Maritime Safety Information broadcasts.

As previously mentioned, NAVTEX broadcasts include the same

Table 1: NAVTEX Broadcasts

Call	Station/Location	ID	Time of Broadcast (UTC)
A9M	Hamala R, Bahrain	B	0010 0410 0810 1210 1610 2010
CBV	Valparaiso R, Chile	B	0010 0410 0810 1210 1610 2010
GCC	Cullercoats R, United Kingdom	G	0048 0448 0848 1248 1648 2048
GNI	Niton R, United Kingdom	S	0018 0418 0818 1218 1618 2018
GPK	Portpatrick R, United Kingdom	O	0130 0530 0930 1330 1730 2130
HZG	Dammam R, Saudi Arabia	G	0630 1800
HZH	Jeddah R, Saudi Arabia	H	0500 1700
JGC	Yokohama R, Japan	I	0120 0520 0920 1320 1720 2120
JNB	Naha R, Japan	G	0100 0500 0900 1300 1700 2100
JNL	Otaru R, Japan	J	0130 0530 0930 1330 1730 2130
JNR	Moji R, Japan	H	0110 0510 0910 1310 1710 2120
JNX	Kushiro R, Japan	K	0140 0540 0940 1340 1740 2140
L2B	Prefectura Naval R, Buenos Aires, Argentina	A	1100 2300
LGP	Bodo R, Norway	B	0018 0418 0800 1218 1618 2100
LGQ	Rogaland R, Norway	L	0148 0548 0948 1348 1748 2148
LGV	Vardoe R, Norway	V	0300 0700 1100 1500 1900 2300
LZW	Varna R, Bulgaria	J	0130 0530 0930 1330 1730 2130
NMA	USCG Miami, FL USA	A	0000 0400 0800 1200 1600 2000
NMC	USCG San Francisco, CA USA	C	0000 0400 0800 1200 1600 2000
NMF	USCG Boston, MA USA	F	0045 0445 0845 1245 1645 2045
NMG	USCG New Orleans, LA USA	G	0300 0700 1100 1500 1900 2300
NMN	USCG Portsmouth, VA USA	N	0130 0530 0930 1330 1730 2130
NMO	USCG Honolulu, HI USA	O	0040 0440 0840 1240 1640 2040
NMQ	USCG Long Beach, CA USA	Q	0045 0445 0845 1245 1645 2045
NMR	USCG San Juan, Puerto Rico	R	0200 0600 1000 1400 1800 2200
NMT	USCG Astoria, OR	W	0130 0530 0930 1330 1730 2130
NOJ	USCG Kodiak, AK USA	J	0300 0700 1100 1500 1900 2300
NOX	USCG Adak Is, AK USA	X	0340 0740 1140 1540 1940 2340
NRV	USCG Apra Harbor, Guam	V	0100 0500 0900 1300 1700 2100
OST	Oostende R, Belgium	T	0248 0648 1048 1448 1848 2248
PBK	NCG Ijmuiden, Netherlands	P	0348 0748 1148 1548 1948 2348
SAH	Haarnosand R, Sweden	H	0000 0400 0800 1200 1600 2000
SDJ	Stockholm R, Sweden	J	0300 0730 1130 1500 1930 2330
SUH	Alexandria R, Egypt	X	0210 0610 1010 1410 1810 2210
SUZ	Serapeum R, Egypt	N	0050 0450 0750 1150 1550 1950
SVH	Iraklion R, Greece	H	0110 0510 0910 1310 1710 2110
SVK	Kerkyra R, Greece	K	0140 0540 0940 1340 1740 2140
SVL	Limnos R, Greece	L	0150 0550 0950 1350 1750 2150
TAF	Samsun R, Turkey	E	0040 0440 0840 1240 1640 2040
TAH	Istanbul R, Turkey	D	0030 0430 0830 1230 1630 2030
TAL	Antalya R, Turkey	F	0050 0450 0850 1250 1650 2050
TAN	Izmir R, Turkey	I	0120 0520 0920 1320 1720 2120
TFA	Reykjavik R, Iceland	R	0318 0718 1118 1518 1918 2318
UBN	Zhanov R, Russia CIS	B	0100 0500 0900 1300 1700 2100
UDC	Mariupol R, Ukraine	B	0100 0500 0900 1300 1700 2100
UFB	Odessa R, Ukraine	C	0230 0630 1030 1430 1830 2230
UFN	Novorossisk R, Russia CIS	A	0300 0700 1100 1500 1900 2300
UGE	Arkhangelsk R, Russia CIS	F	0200 0600 1000 1400 1800 2200
UMN	Murmansk R, Russia CIS	C	0120 0520 0920 1320 1720 2120
UNC	Tallinn R, Estonia	U	0030 0430 0830 1230 1630 2030
VCO	CCG Sydney, NS Canada	Q	0240 0640 1040 1440 1840 2240
VPS	Victoria Harbor R, Hong Kong	L	0200 0600 1000 1400 1800 2200
VWB	Bombay R, India	G	0900 1700
VWM	Madras R, India	P	0630 1830
XSG	Shanghai R, China	Q	0240 0640 1040 1440 2240
XSQ	Guangzhou R, China	N	0210 0610 1010 1410 2210
5BA	Nicosia R, Cyprus	M	0200 0600 1000 1400 1800 2200
9AS	Split R, Croatia	Q	0250 0650 1050 1450 1850 2250
9HD	Valetta R, Malta	O	0220 0620 1020 1420 1820 2220

notices that have been provided by the MF Morse weather broadcasts (MOR E).

The notice stated that distress and other calls to any US Coast Guard Communication Station can be made on any of the following HF SSB radiotelephone channels:

ch 424 4134 kHz ch 601 6200 kHz ch 816 8240 kHz
ch 1205 12242 kHz

Meteorological (weather) broadcasts are also made on these channels. The Coast Guard believes the aforementioned options provide sufficient redundancy to assure that adequate distress and safety communication capabilities are available.

Table 2: Navy MARS Update

NNN0CAA	USS Newport (LST-1179)	Decommissioned
NNN0CCN	USS Monterrey (CG-61)	FPO AA 34092-1182
NNN0CEK	USS Wasp (LHD-1)	FPO AE 09556-1660
NNN0CLT	USS Elliott (DD-967)	FPO AP 96664-1205
NNN0CNE	USS England (CG-62)	FPO AP 96664-1146
NNN0CNJ	USS Caron (DD-970)	FPO AE 09566-1208
NNN0COF	USS Gettysburg (CG-64)	FPO AA 34091-1184
NNN0COT	USS Fairfax County (LST-1193)	FPO AE 09569-1814
NNN0COU	USS Saratoga (CV-60)	FPO AA 34078-2740
NNN0COZ	USS Forrestal (CV-59)	FPO AA 34080-2730
NNN0CPC	USCGC Boutwell (WHEC-719)	FPO AP 96661-3902
NNN0CRW	USS Guam (LPH-9)	FPO AE 09563-1640
NNN0CSL	USS Dale (CG-19)	FPO AA 34090-1143
NNN0CSO	USS Chosin (CG-65)	FPO AP 96662-1185
NNN0CUG	USS Texas (CGN-39)	FPO AP 96698-1166
NNN0CUS	USS Inchon (LPD-12)	FPO AE 09529-1655
NNN0CVL	USS Shreveport (LPH-12)	FPO AE 09587-1714
NNN0CVV	USS Yellowstone (AD-41)	FPO AE 09512-2525
NNN0CVX	USS El Paso (LKA-117)	FPO AE 09568-1704
NNN0CXB	USS John F. Kennedy (CV-67)	FPO AE 09538-2800
NNN0CXM	USS McInerney (FFG-8)	FPO AA 34092-1466
NNN0CUZ	USS Puget Sound (AD-38)	FPO AE 09544-2520
NNN0CCK	USS Comstock (LSD-45)	FPO AP 96662-1733
NNN0CYY	USS Yorktown (CG-48)	FPO AE 09594-1159
NNN0CYZ	USS San Jacinto (CG-56)	FPO AE 09587-1176
NNN0CZJ	USS Whidbey Island (LSD-41)	FPO AE 09591-1729
NNN0CZK	USS Arkansas (CGN-41)	FPO AP 96660-1168
NNN0NAL	USS Abraham Lincoln (CVN-72)	FPO AP 96612-2872
NNN0NAP	USS Milwaukee (AOR-2)	FPO AE 09578-3024
NNN0NXN	USS Yosemite (AD-19)	FPO AA 34083-2510
NNN0NZX	USCGC Polar Star (WAGB-10)	FPO AP 96698-3920
NNN0NZZ	USS Kitty Hawk (CV-63)	FPO AP 96634-2770

NMF Broadcast Information

If you are interested in marine broadcasts from the Coast Guard, here is the latest broadcast schedule from NMF, the Coast Guard Communications Station in Boston, MA.

Voice (USB): 2670 kHz at 0440, 1040, 1640, 2240. UTC broadcasts include: local Notices to Mariners (NTM), offshore Boston weather, coastal Boston weather, coastal Portland, ME, weather, and High Seas weather.

SITOR: 0140 UTC on 6312.3 8414.8 12577.3 (Window Frequencies) and 1630 UTC on 8414.8 12577.3 16804 (Window Frequencies). Broadcasts include: NAVAREA IV, Hydrolants, Atlantic Area Notice to Fisherman and High Seas weather.

Morse Code (CW): 0130 and 1450 broadcasts on 472 kHz includes offshore Boston weather and local NTMs. The 1350 broadcast on 472 and 8502 kHz includes Atlantic Area Notices to Fisherman.

New Navy MARS Callsigns

Several folks answered my request for help in updating the *Shortwave Directory* list of Navy MARS (Military Affiliate Radio System) callsigns. One of them was William Genter in New York. Table 2 is the list Mr. Genter sent in.

I have added to each callsign listing, the new FPO (Fleet Post Office) address for each ship for those interested in sending reception reports. I have also noted any changes in each ship's commissioning status. Remember, a good place to hang out to monitor Navy MARS activity is 14441.5, the Navy MARS Afloat 14 MHz calling channel in the USB (Upper Side Band) mode.

Thanks to all that contributed to this month's column. Now it's time for a cool Hurricane and a sail boat ride on Lake Ponchartrain. But before you switch that dial, here is what has been heard in the Utility World this month...

Utility World

Utility Loggings

Abbreviations used in this column

AF	Air Force	LDOD	Long Distance
AFB	Air Force Base		Operational Control
AM	Amplitude Modulation	LSB	Lower Side Band
ARQ-E3	Single channel ARQ	MARS	Military Affiliate
	ITA3 system		Radio System
ARQ-M2	Multiplex ARQ system	Meteo	Meteorological
	with two channels	MFA	Ministry of Foreign
AT&T	American Telephone		Affairs
	and Telegraph	MSI	Marine Safety
BBS	Bulletin Board System		Information
CIS	Commonwealth of	MWARA	Major World Air
	Independent States		Route Areas
COMSTA	Communications	m/v	Motor Vessel
	Station	NG	National Guard
CQ	General call for any	Ops	Operations
	station	RTTY	Radioteletype
CW	Continuous Wave	SAR	Search and Rescue
	(Morse Code)	SITOR-A,B	Simplex printing
FAA	Federal Aviation		over radio codes
	Administration	Sovship	Soviet ship
FAF	French Air Force	SWED-ARQ	Swedish ARQ code
Fax	Facsimile	TS	Time Station
FF	French Forces	Unid	Unidentified
FM	Frequency Modulation	US	United States
GHFS	Global HF System	USAF	United States Air Force
GPS	Global Positioning	USB	Upper Side Band
	System	USCG	United States Coast Guard
HF	High Frequency	USCGC	USCG Cutter
ID	Identification	USMAG	United States Military
KCNA	Korean Central News		Assistance Group
	Agency	USN	United States Navy

All frequencies in kilohertz (kHz), all times in UTC. All voice transmissions in English unless otherwise noted.

- 50.00 OMA50-TS Vinohrady, Czechoslovakia, at 1410 with time signals and CW ID. (Ary Boender-Netherlands)
- 60.00 MSF-TS Rugby, England, at 1403 with time signals and CW ID. (Boender-Neth)
- 75.00 HBG-TS Prangins, Switzerland, with time stations and CW ID at 1420. (Boender-Neth)
- 77.50 DCF77-TS Mainflingen, Germany, with time signals and CW ID at 1414. (Boender-Neth)
- 442.50 FFB-Boulogne-Sur-Mer Radio, France, with CW weather broadcast at 1256. (Boender-Neth)
- 3476.0 Shanwick, Ireland, and Gander, NF, aeradio working several aircraft in USB at 0337. (Bill Fernandez-MA) *New NAT-FMWARA frequency-Larry.*
- 3989.0 XFL-Mazatlan Radio, Mexico, calling CQ using CW (spark) at 0800. (Wayne Rankin-Tujunga, CA)
- 4015.0 AE1USA-US Army MARS Lohnsfeld, Germany, working AE1VLK using packet at 1900. (Boender-Neth)
- 4029.0 Spanish female 5-digit number station in AM at 0500 (Fri). (Tom Mazanec-Maple Heights, OH)
- 4106.5 Fisherman chit-chatting in USB at 1315. (Ted Hay-Watford, ON, Canada)
- 4357.0 KMI-AT&T Inverness, CA, working m/v Westward at 0440 in USB. (Gordon Levine-Anaheim, CA)
- 4640.0 English female 3/2-digit number station in AM at 0015. (James Henderson-Wilmington, DE)
- 4725.0 Beanpile working McClellan GHFS with data frequency request in USB at 0517. McClellan moved station to 6817 then 9320. (Jeff Haverlah-Humble, TX)
- 4780.0 Israeli Mossad KPA2 number station in AM at 0318. (Hardesten-NC)
- 5000.0 VNG-TS Llandillo, Australia, under WVVH with time ticks in AM at 1644. (Gerald Brookman-Kenai, AK)
- 5083.5 Moderator Echo/Bravo, USAF with mention of Dobbins AFB and 52nd CCS in USB at 0345. Also using 4751.5. (J. Metcalfe-KY)
- 5317.0 Fishing boats with some X-rated language in USB at 0251. (Russ Hill-Oak Park, MI)
- 5320.0 USCG Group Fort Macon, NC, working NUIH-USCGC Point Warde with traffic in USB at 0224. (Hill-MI)

- 5650.0 Tuna fishing boats discussing their catch in USB at 2300. (Henderson-DE)
- 5680.0 Kap Radio calling Baker Lake and Lynn Lake with radio checks in USB at 2245. (Hay-ON)
- 5692.0 USCG Group Cape May, NJ, working USCGC Biscayne Bay and NODM-Hornbeam and Rescue 6576 with SAR traffic. (Hill-MI)
- 5696.0 Travis AFB, CA, radio maintenance calling for a radio check in USB. USCG COMSTA Honolulu, HI, answered at 0755. (Scott Burke-Tucson, AZ)
- 5718.0 Edmonton Military working 303 in USB at 0201. (Hay-ON)
- 5762.0 Spanish female 5-digit number station in AM at 0400 (Fri). (Mazanec-OH)
- 5770.0 German female 5-digit number station in AM at 0743. (Fernandez-MA)
- 6224.0 VA4219-m/v Southbound II in Hamilton, Bermuda, daily at 2230 in USB with weather for vessels in North Atlantic and Caribbean by operator Herb Hilgenberg. (Chris Danilek-Darien, CT) *Welcome to the column Chris-Larry.*
- 6236.0 CG 1719 working USCGC Legare in USB at 0413. (Brown-MA)
- 6280.0 IGJ-Augusta Naval Radio, Italy, with V CW marker at 0550. (Hardesten-NC)
- 6295.3 KKN50-Department of State Radio, Washington, DC, with CW QRA marker at 0940. (Dix-NY)
- 6575.0 New York Aeradio working various flights from 0433-0521 in USB. (Mary Ann Kehoe-Atlanta, GA) *Welcome to the column Mary Ann; nice to meet you in Atlanta last year, hope to see you again this year-Larry.*
- 6586.0 New York Aeradio working various flights from 0130-0410 in USB. (Levine-CA)
- 6628.0 New York and Santa Maria (Azores) Aeradio with Air France 533 inflight emergency in USB at 0500. (Carl West-Laguna Hills, CA)
- 6649.0 Panama Aeradio working various aircraft in USB at 0412. (Levine-CA)
- 6683.0 AFA-Andrews AFB working unid aircraft in USB gave designator as F118. (Ron Bruckman-Hampstead, MD)
- 6713.5 Gram working Justice in USB at 0335. (H.Brown-MA)
- 6776.0 Scorpion Control calling Scorpion 1 in "HF plain" at 1445 in USB. (Metcalfe-KY)
- 6798.0 Spanish female 5-digit number station in AM at 0600 (Fri). (Mazanec-OH)
- 6934.0 Spanish female 5-digit number station in AM at 0500. (James Laughlan-Youngstown, NY) *Welcome to the column, James; please check-in often-Larry.*
- 6990.0 Man with definite British accent shouting letter number groups at 0420. (Thomas Martin via Grove BBS) *No mode indicated; I show nothing, Tom-Larry.*
- 6995.3 Various Army MARS stations using packet at 2142. (Bruckman-MD)
- 7536.5 US military stations Alpha 37, 38, 39 with mention of GPS coordinates in USB at 1737. (Metcalfe-KY)
- 7654.0 English female 3/2-digit number station in AM at 2100 parallel to 9090. (Mazanec-OH)
- 7696.3 CBOFKFD using ARQ-M2 channel A at 0058. (Hay-ON)
- 7821.6 LYNX-MFA Lagos, Nigeria, with CW marker and idler at 0047. (Dix-NY)
- 7919.0 Blow Fuse setting up data circuit with Andrews AFB in USB at 0254. Later heard Egg White calling Blow Fuse on 11226.0. (Metcalfe-KY)
- 8119.6 Several stations heard here in USB talking about production cost plus helos and 22 trucks. (David Howden via Grove BBS) *Only thing I show is FAA on 8120.0; thanks for the note via the BBS-Larry.*
- 8168.5 Show Me Charlie (MO NG) with net call at 1430 in USB. Net active every Tuesday. (Metcalfe-KY)
- 8460.5 PPL-Belem Radio, Brazil, with V CW marker at 2306. (Mark Janacek-Summit, NJ)
- 8474.0 HCG-Guayaquil Radio, Ecuador, with V CW marker at 1153. (Dix-NY)
- 8497.0 HLJ-Seoul Radio, South Korea, with CQ CW marker at 1201. (Dix-NY)
- 8500.0 XSV-Tianjin Radio, China, with CQ CW marker at 1140. (Dix-NY)
- 8606.0 7J calling 7Z in USB and LSB, then into RTTY at 2227. (Harry Riddell-Rochester, NY) *Welcome to the column, Harry-Larry.*
- 8822.0 November 355QS working Rockwell Flight Test in USB at 1811. (Brown-MA)
- 8861.0 Dakar, Senegal, with rocket launching notice in USB at 0143. (Hay-ON)
- 8967.0 Jeddi Lead working Jeddi 3 in USB at 0328. (Brown-MA)
- 8976.0 S8U working Cowpoke in USB at 0535. Mentioned going RTTY. (Burke-AZ)
- 9017.0 Raymond 7 working Read 01 with phone patch in USB at 1630. (Haverlah-TX)
- 9066.5 X4A and O8D passing messages. At end said have a good Army day in USB at 1701. (Burke-AZ)

9090.0 English female 5-digit number station in AM at 2115. (Brown-MA)
Same at 2100 (Bill Perrelli-Hamden, CT)

9119.3 I9B and N7C in LSB at 1520. (Metcalfe-KY)

9360.0 OXT-Copenhagen, Meteo, Denmark, with fax weather chart at 0005. (Dix-NY)

10018.0 Colombo, Sri Lanka, and Karachi, Pakistan, Aeradio working various aircraft in USB at 1233. (Riddell-NY) *This is the Middle East (MID-2) MWARA-Larry.*

10024.0 Santiago, Chile, Aeradio working various aircraft in USB at 2340. (Riddell-NY) *This is the Southwest South America (SW-SAM) MWARA-Larry.*

10028.0 Prague LDOC, Czechoslovakia, working various aircraft in USB at 1458. (Boender-Neth)

10066.0 Dacca, Bangladesh, and Yangon, Myanmar, Aeradios working various aircraft in USB at 1207. (Riddell-NY) *Nice catch, South East Asia (SEA-1) MWARA-Larry.*

10259.3 RCF-MFA Moscow, Russia, with RTTY test tape at 1640. (Robert Hall-Capetown, RSA)

10869.3 RFVI-FF Le Port, Reunion, with ARQ-E3 idling at 0515. (Hall-RSA)

10905.0 Acrobat-Andrews AFB calling Zulu in LSB at 1422. (Metcalfe-KY)

11070.0 LOR-Argentine Naval Radio Puerto Belgrano with RTTY weather messages at 1705. (Dix-NY)

11150.0 Wasp working 24 Rear in USB at 2200. (Metcalfe-KY)

11176.0 Mogadishu working calling several GHFS stations in USB at 2116, no luck. Accuse Delta also on working Albrook. Wanted to run patches; said to use Mission Radio frequencies and callsign AHF2. Frequencies passed were: 6030 9530 11805 15330 and 17756; all inside international broadcast allocations. (Fernandez-MA) *Nice log, Bill-Larry.* Possible civilian aircraft at 1800, GHFS mentioned same frequencies as last log. (James Ashe-Weymouth, MA)

11198.7 LYNX-MFA Lagos, Nigeria, with CW marker and idler tones at 2117. (Fernandez-MA)

11214.0 Sentry 93 working Raymond 24 and Eagle 1 in USB at 1601. (Brown-MA)

11226.0 Crazyweed trading authentication codes with Resentment in USB at 1700. (Daniel Armaniera-Sylmar, CA) Nightcap working MacDill GHFS in USB at 2112 talking about RTTY setup. (Fernandez-MA)

11306.0 Lima LDOC Radio, Peru, working various American flights in USB at 0322. (Brown-MA)

11330.0 New York Aeradio working several aircraft in USB at 1947. (Fernandez-MA)

11420.0 BDF-Shanghai Meteo, China, with fax weather chart at 2355. (Dix-NY)

11477.7 HMF52-KCNA Pyongyang, North Korea, with news photo Fax at 2300. (Perrelli-CT)

12056.5 Day Letter (USAF) attempting to contact Acrobat at 1454 in LSB. (Metcalfe-KY)

12293.5 YOY, Q8G, F9I in LSB voice and 300 baud packet in clear at 1800. (Rankin-CA) *Other stations have been heard here in the past, interesting-Larry.*

12579.0 NRV-USCG Apra Harbor, Guam, with MSI International Marine weather broadcast using SITOR-B at 0515. (Hall-RSA)

12657.0 UDK-Murmansk Radio, Ukraine, with DE CW marker at 1245. (Janacek-NJ)

12675.5 A4M-Muscat Radio with CW DE marker at 1223. (Dix-NY)

12777.0 NDT-USN Yokosuka, Japan, with fax weather charts at 2246. (Dix-NY)

12797.0 UDK2-Murmansk Radio, Ukraine, calling 4LS in CW at 1222. (Boender-Neth)

12804.0 YQI5-Constanta Radio, Romania, working m/v Evlomar in CW at 1223. (Boender-Neth)

12870.0 UKA-Vladivostok Radio, Russia, CIS with CW traffic at 2327. (Dix-NY)

12973.0 UJY-Kaliningrad Radio, Russia, with CW traffic list at 1302. (Boender-Neth)

13046.0 PZN-Paramaribo Radio, Surinam, with CQ CW marker at 0955. (Dix-NY)

13077.0 WAH-St Thomas, VI, in USB concluding traffic list at 1901. (Fernandez-MA)

13312.0 Moody Ops working SECAF Radio Flight test Ops (Waco, TX). AF049 calling SECAF, needed FM frequency, passed 151.0, 123.055(AM) or 257.355 (AM) at 1501 in USB. (Burke-AZ)

13216.0 CBBFH working CBMFD-Santiago Naval, Chile, with ARQ-M2 messages at 0500. (Amaniera-CA)

13285.0 Beijing VOLMET, China, with USB aviation weather for various locations in China at 0545. (Brookman-AK)

13950.0 F4 and F58 (USMAG) in LSB at 2100. (Riddell-NY)

14470.0 US Navy MARS NNN0COV and NNN0ZTI with USB traffic at 2122. (Mike Starr)

14467.0 FDC-FAF Metz-Frascaty, France, with V CW marker at 1929. (Dix-NY)

14776.0 WGY908 and WGY905 (FEMA) running USB voice and "Fourwire" data transmissions at 1725. Duplex on 14776 (mostly voice and data)

and 13446 (voice and phone circuit tones). (Haverlah-TX)

15015.0 Shark 08 working Albrook GHFS, Panama, with phone patch to Raymond 9 and Lobo in USB at 1420. Purpose of patches was to get working HF frequencies for Lobo: 8972, 6750 kHz and 232.0 MHz. (Haverlah-TX)

15950.0 RBT77-Moscow Meteo with fax charts at 1159. (Boender-Neth)

16080.0 Syracuse (also on 13210) working Trout 99 in USB at 1844 with personal and job related chit chat. Also heard on 11243 (called primary) and very briefly on 8021 (very weak here). Not Mystic Star related. (Haverlah-TX)

16807.5 GKE6-Portishead Radio, England, with SITOR-B PAN PAN distress broadcast for the yacht "Coyote" at 1708. (Hall-RSA)

16808.0 SPA81-Gdynia Radio, Poland, with DE CW marker at 1116. (Boender-Neth)

16816.0 ZSC-Capetown Radio, RSA, with SITOR-A traffic at 1849. (Dix-NY)

16820.0 IAR-Rome Radio, Italy, with CW ID at 1120. (Boender-Neth)

16834.5 SAB8-Gotenborg Radio, Sweden, calling ERSP-m/v Robert Eikhe in CW at 1125. (Boender-Neth)

16857.0 UDE-Odessa Radio, Ukraine, working UHRO-m/v Skoulptor Goloubkina in CW at 1100. (Boender-Neth)

16903.0 UJY-Kaliningrad Radio, Russia, working various vessels using SITOR-A at 1132. (Boender-Neth)

17010.0 URD-St Petersburg Radio, Russia, with CQ CW marker at 1205. (Boender-Neth)

17115.0 URD-St Petersburg Radio, Russia, with CQ CW marker at 1208. (Boender-Neth)

17160.0 PWZ33-Rio de Janeiro Naval Radio, Brazil, with V CW marker at 2236. (Dix-NY)

17184.5 KFS-Palo Alto (San Francisco) Radio, CA, with CQ CW marker at 0100. (Janacek-NJ)

17206.0 IAR-Rome Radio, Italy, with CW V marker at 1212. (Boender-Neth)

17937.0 Lima LDOC Radio, Peru, working American Airlines 906 in USB at 1949. (Henderson-DE)

17992.0 WAR46 briefly working Golfball on Xray 908. Golfball also worked Songbird in USB at 1654. Setup this frequency as primary and Xray 905 (11226) as a secondary data frequency. Songbird very weak this frequency and very strong on 11226. (Haverlah-TX)

18670.0 RRG26-Radio Moscow broadcast feeder in USB with Russian chit-chat at 1225. (Hall-RSA)

19808.0 "Norsk Ambassade, Lagos" Nigeria working MFA Oslo, Norway, using SWED-ARQ at 1202. (Hall-RSA)

20157.0 5KM-Bogota Naval, Colombia, with 75 baud RTTY messages at 2100. (Amaniera-CA)

20614.1 RFTJD-FF Libreville, Gabon, with ARQ-E3 idling at 1520. (Hall-RSA)

20885.0 F4 and 261 (USMAG) in LSB at 1250. (Riddell-NY)

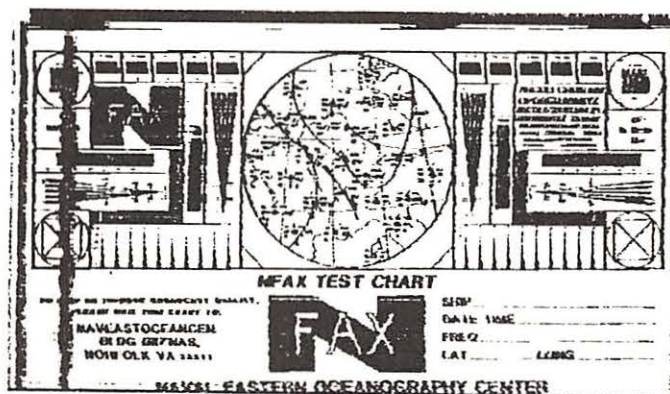
22696.0 BVA-Taipai Radio with ID in English several times at 0058 in USB. (Levine-CA)

22930.2 SIDA-Stockholm, Sweden, with 5 letter groups for "Ambassaden Windhoek" using SWED-ARQ at 1247. (Hall-RSA)

23005.9 NPN-USN Apra Harbor, Guam, with weather fax charts at 1242. (Hall-RSA)

23023.8 Greek Embassy, Zaire, with traffic in Greek using SITOR-A at 1323. (Hall-RSA)

25355.9 AQP4-Karachi Naval Radio, Pakistan, with CW marker at 1128. (Hall-RSA)



Clifford Nadiger, Copperas Cove, TX, received this fax: NAM, Norfolk, VA; 20013.28 kHz, 14:30 UTC.

The Scanning Report

Bob Kay

c/o MT, P.O. Box 98
Brasstown, NC 28902

Ask and Receive

Scanning is America's ultimate hobby. Push a few buttons and you can listen to police and fire departments, SWAT teams, Medevac crews and more. Whether you're in the mood for a relaxing boat ride or a thundering trip aboard the space shuttle, scanning is the one hobby that can take you there.

But as we all know, you can't hear the action without the right equipment. And it's nearly impossible to select the proper equipment without asking questions. Here are a few of the most common questions that appear in my mailbox.

"Can I use a commercial grade 800 megahertz transmitting antenna to monitor the 800 megahertz band?" Yes — any good transmitting antenna will make a good receiving antenna.

"What is the best height for a scanning antenna?" If you can see the horizon from your antenna's location, (clear of nearby buildings and trees) that's the best height. Any increase in height above the horizon, (unless it is substantial) will do little to improve your reception.

"My antenna uses a 'Balun.' What does it do?" The maximum signal transfer from your antenna to receiver occurs when the antenna impedance matches the receiver input impedance. If the system is mismatched, signal strength will be compromised. The balun is a matching transformer that helps to provide maximum signal transfer between your antenna and feed line.

"Will grounding my scanning antenna improve its performance?" No. Antennas are grounded to help protect your home and equipment from lightning and static discharge. The procedures for grounding your antenna will probably be regulated by local building codes. Insurance companies can refuse to settle a claim if your grounding procedures did not comply with state and local code requirements.

"What type of coax cable do you recommend?" I utilize RG-6 exclusively throughout my listening post. For 800 megahertz monitoring, I use cellular telephone coax that can be purchased from any cellular installation center.

"Do cable TV connectors/splitters affect the strength of radio signals?" Yes. When you cut the line to add a splitter or adapter, you'll decrease the signal between 30 and 50 percent. In the 800 megahertz band, the loss may even be greater. To receive the maximum signal, use a continuous length of coax between your antenna and scanner radio.

"Will a preamplifier increase my listening range?" If your lead-in is 50 feet or less and if your main listening targets are the public service bands, a pre-amp will do little to improve or increase your reception. Broadband preamplifiers amplify all the signals — including those that you don't want. The result is an increase in images and intermod. If you

must use an amplifier, choose one with a narrow bandwidth and low noise characteristics.

"I can't afford to buy a new scanner radio that receives the 800 megahertz band. Do you have any suggestions?" Check out the "Super Converter" from GRE America. The unit converts 810-950 MHz down to 410 - 550 MHz. GRE has converters for base and hand held scanner radios. For more information look for GRE America products in Grove's catalog or in the pages of MT.

"Will I void my warranty, if I modify my Radio Shack scanner to receive the cellular band?" Probably so. Any manufacturer would certainly frown upon aftermarket modifications. The situation becomes especially tricky if you purchased an extended warranty. If the company detects tampering, they could legally refuse to honor the warranty.

"When I enter 162.4375 into my scanner, it appears as 162.435. What happened?" Scanner radios typically have 5 kHz resolution. That's not very accurate, but since narrowband FM signals are very broad, you'll hear the station.

"I have several crystal controlled Bearcat scanner radios. Where can I get them repaired?" Nearly every type of scanner radio can be repaired by G & G Communications, 9247 Glenwood Drive, Leroy, NY 14482, (716) 768-8151. G&G Communications routinely repairs the Bearcat 210's, 250's and 300's. They also have a large inventory of replacement parts for new and old scanner radios.

"Are there any speech decoders on the market?" The Electronics Communication Privacy Act has made decoders illegal to manufacture or use. Even simple speech inversion descramblers are not available.

"How can I boost the audio of my hand held when I use it in my vehicle?" Plug your scanner radio into Radio Shack's "Compact Disc Cassette Adapter" catalog #12-1951. The CD adapter plugs into your scanner radio and is inserted into your cassette player. With this set-up, even pedestrians walking on the street will be able to hear your scanner radio!

For answers to all your radio related questions, check out Bob Grove's *Scanner and Shortwave Answer Book*. It's filled with commonly-asked questions from both scanning and shortwave enthusiasts. The book retails for \$12.95 and can be purchased from Grove Enterprises, 1-800-438-8155.

Treasure Hunt

Are you serious about your 800 megahertz listening? Are you looking for a professional quality 800 megahertz antenna with remarkable gain? If so, you're looking in the right place. MAX antenna systems has an 11 element, beam antenna, specifically made for the 800 megahertz band. The antenna is a loop Yagi that can be mounted in a fixed position or rotated with a TV antenna rotor.

The antenna is 36" long x 7" wide and will pull in 800 to 900 megahertz signals with a whopping 15 dB's of gain. To win the MAX System 800 MHz loop Yagi, here are the clues:

1. When two antennas are mounted in the same vertical plane, they should be placed at least one-half wavelength apart. True or False?
2. Explain the abbreviation: "CMRS"
3. Use the January 93 issue of MT and provide the 800 number for MAX System Antennas.
4. Radio waves travel at the speed of light. True or False?
5. Provide the frequency spread for television channel 80.



Selecting the right equipment can be a frustrating and costly experience. To help you make the right choice, the Scanning Report answers your most frequently asked questions.

The loop Yagi retails for \$75.00 dollars plus \$4.00 dollars shipping. For more information contact: Cellular Security Group, 4 Gerring Road, Gloucester, Massachusetts 09130, (508) 281-8892.

Frequency Exchange

Welcome to *Poughkeepsie, New York*. Pat Libretti lives nearby and here are his favorite frequencies (MHz).

33.48	Police dispatch	154.665	NY State Police car to car
39.14	Dutchess City Sheriff	155.15	Police
45.62	Drug task force	155.415	Police
45.82	Drug task force	155.70	New Platz police
46.46	Fire Dept.	453.525	NY State Thruway Patrol
153.80	Fire Dept.	464.375	Poughkeepsie cable TV

Our next stop was arranged by David Jessop Sage. Here are Dave's frequencies for *Boston, Massachusetts*.

42.34	State Police	450.05	WBZ news
42.40	State Police	450.1125	Metro traffic
42.44	Statewide emergency	450.35	WBZ TV "live"
42.46	Car to car	450.55	WBZ reporters
42.50	State Police	450.6125	WNEV TV crews
42.54	Base units	455.65	WBZ Helicopters/traffic
159.05	Turnpike Police		

Dave's complete list contains over 300 frequencies for the Boston area. The list is free for a #10 SASE. Send your requests to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Frank Morfe has invited us to monitor the medical frequencies in *Baltimore, Maryland*.

46.28	Trauma Helicopter
44.74	Trauma Helicopter
163.25	John Hopkins Hospital voice paging
461.775	John Hopkins Hospital Security
464.675	Mercy Hospital F-1
464.875	Mercy Hospital F-2

Frank also included the following non-medical frequencies.

33.06	Sanitation
46.00	Baltimore County Public Works
48.05	Water Department
153.45	Gas trouble
153.605	Baltimore Gas & Electric--trouble
154.80	Hickey Correctional School
155.715	Towson State University Police
161.565	Baltimore subway maintenance
451.10	Baltimore Gas & Electric
464.75	Howard's plumbing

We've got two invitations to visit the "lone star state." Our first stop will be the home of Brett Prescher, in *Gainesville, Texas*.

37.68	Texas Power & Light	159.27	Game Warden
46.40	Gainesville Dog Catcher	160.335	ATSF railroad
47.18	Texas Highway Dept.	160.56	ATSF railroad
47.66	Refinery Road, Vet clinic	161.65	KGAF radio
151.895	Cooke County Appliance	451.725	Highway repair
152.27	Taxi	464.05	Gainesville Const. Co.
152.885	Gainesville Fuel Co.	856.3875	Gifford Hill Concrete

GUIDE TO UTILITY STATIONS 1993

11th edition • 534 pages • \$ 52 or DM 70

5000 new coastal and fixed station frequencies!

Our bestseller covers the complete frequency range between 0 and 30 MHz. We are the very first non-governmental monitoring service to use state-of-the-art equipment such as the revolutionary new WAVECOM W4100 teleprinter systems decoder. Latest military and political events such as the impacts of the Gulf War and the Balkan War, and of the recent and current revolutions in Eastern Europe, are covered exclusively by our UTILITY GUIDE - *now* and not five years later! Sophisticated operating methods and regular overseas monitoring missions (1992 for months in Brunei, Dominica, Indonesia, Malaysia, Martinique, Sabah and Sarawak) complete this unique book.

The completely revised new edition includes a frequency list with 19549 frequencies, and a call sign list with 3590 call signs. Up-to-date schedules of FAX meteo stations and RTTY press services are listed both alphabetically and chronologically. Abbreviations, addresses, codes, definitions, explanations, frequency band plans, international regulations, modulation types, NAVTEX schedules, Q and Z codes, station classes, telex codes, etc. - this reference book lists everything. Thus, it is the ideal addition to the World Radio TV Handbook for the "special" stations on SW!

Further publications available are *Air and Meteo Code Manual*, *Guide to Facsimile Stations and Radioteletype Code Manual* (12th editions). We have published our international radio books for 23 years. They are in daily use with equipment manufacturers, monitoring services, radio amateurs, shortwave listeners and telecommunication administrations worldwide. Please ask for our free catalogue, including recommendations from all over the world. For recent reviews of our books by Bob Grove see *MT* 2/92, 3/92, and 9/92. All manuals are published in the handy 17 x 24 cm format, and of course written in English.

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Our next stop is *Dallas, Texas*. To help us avoid traffic problems, Steve Hiegel has provided the following:

450.0625	KLIF/KPLX traffic helicopter
450.150	KRLD traffic helicopter
450.4125	KVIL traffic helicopter
450.5875	Traffic Patrol (various stations)
450.6125	WBAP traffic
453.850	Dallas Street Department
460.275	Dallas Police Traffic Division

In *Battle Creek, Michigan*, we can listen to the frequencies provided by Kenneth Britten.

154.25	Fire Dispatch F-1	155.10	Sheriff F-2
154.28	Fire Dispatch F-2	155.37	Police, statewide
154.86	Police	155.535	Sheriff F-1

The next stop is *Chicago, Illinois*. Our invitation was signed by Roy Cloutier, and he has invited us to sample his favorite frequencies.

47.42	American Red Cross	451.425	Com Ed underground vault crews
138.575	FEMA repeater (141.950)		
147.225	SATURN/Salvation Army network	453.100	City supervisors and phone techs.
153.575	Com Ed line crews (158.145 in)	453.825	Human Services & shelters
153.830	Fireground and command post	453.975	City Electrical Dept.
		472.237	National K9, at closed subways
158.250	City Water leak desk		
166.175	NTSB subway inspection teams		

We end the April Frequency Exchange with a Spring visit to *Yosemite National Park, California*. Break out your picnic baskets and enjoy!

47.58	Medical	157.56	ARA transportation
47.62	Medical	168.35	Search & rescue
151.685	Security/maintenance	171.80	Maintenance
151.895	Security/maintenance	172.625	Fire department
154.515	Shuttle buses	172.650	Rangers, fire & ambulance
154.60	Security	172.755	Fire department

7 Million Dollar Radio

The city of Oakland County, Michigan, spent 7 million dollars to install an 800 megahertz trunked system. County commissioners are angry because portable radios cannot transmit or receive in some buildings.

Sheriff deputies are now carrying both the old and new radios on their belts, using one or the other depending on their location. Motorola blamed the problem on an internal microchip in the hand held radios. Meanwhile, the County is trying to re-negotiate the Motorola contract. (News clipping from the *Daily Tribune*.)

Canadian Cellular

Canada has passed a new law that prohibits scanner buffs from monitoring cellular phones. Similar to the American "Electronics Communication Privacy Act," the Canadian law imposes fines and imprisonment for intercepting cellular calls. (News clipping from the *Ontario Essex*.)

Scanner CPR

A one year old baby boy who nearly drowned in his bathtub was rescued by a scanner buff. When Phil Colten heard the 911 call on his scanner radio, he ran to the house and administered CPR until the paramedics arrived.

Newspaper Frequencies

The hobby of scanning has been featured in newspapers across the nation. But the *Florence Morning News* in Dallas, Texas, went one step further. Their scanning article included a frequency chart for local communities. Here's a partial list of what was printed:

Rural Fire Departments

42.26	West Florence	153.83	Lower Florence
46.16	Palmetto	154.385	Lower Florence
46.60	Palmetto	154.43	Johnsville
46.38	Howe Springs	154.445	Darlington
153.95	Windy Hill	153.865	Darlington
154.31	Windy Hill	158.865	Darlington

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COVERAGE FROM THE
SPACE SHUTTLE

1-900-909-NASA



NORTHEAST SCANNING NEWS:

P.O. Box 62, Gibbstown, NJ 08027

Sammy the Scanner

1992 Treasure Hunt Winners

Jan/Feb

Frequency Allocation Cards
Everyone who entered was a winner

July/Aug

Digital Weather Station
Jay Kruckenberg, Moreland, OK

Mar/Apr

Police Call
Henry Kelley, Belen, NM
F.L. Miller, Spring Valley, NY

Sept/Oct

Optoelectronics Frequency Counter
Marcus Crouch, Tyler, TX
Bruce Holmen, Duluth, MN

May/June

Parson's Software
Brad Thiele, Sandy, UT
Joe Wirtz, Boyce, LA

Nov/Dec

Capri ScanRecord
Jan Roth, Long Beach, CA
Dan Myers, Abington, PA

Highway Patrol

33.76
42.08
155.16
155.265
155.640
155.955

Emergency Medical

155.205
155.22
155.34

Computer Corner

Two popular frequency management programs are RAC & RADIOLOG. The earlier versions of RADIOLOG would not allow the same frequency to be entered twice. The new version of RADIOLOG (Version 3.1) allows identical frequencies to be entered throughout the file. The RAC Frequency Management program is an earlier shareware version 1.1. It is now available in an updated commercial version which can be used with the Grove Database. (Call 407-451-2137 for info.)

You can obtain a copy of RAC version 1.1 and the 3.1 version of RADIOLOG by sending a formatted, 5-1/4 disk with mailer and postage to, Bob Kay, P.O. Box 173, Prospect Park, PA 19076. If you'd rather I provide the disk, mailer and postage, send \$4.00 dollars to Bob Kay, P.O. Box 173, Prospect Park, PA 19076.

Trunking Tricks

Can't find the frequencies of an 800 megahertz trunked system? No problem — here's the solution. Trunking frequencies occur in blocks of five. Each frequency will be separated by 1 MHz. If you place your scanner in the search mode and discover 902.1575, the other frequencies will be 903.1575, 904.1575 and so on. To find the starting point of the block, load five frequencies higher and five frequencies lower than the known frequency. Then sit back and listen — it won't take very long to discover the active frequencies.

VHF Antenna Plans

Here's a nice springtime project that anyone can enjoy. I've got a complete set of plans for building a long wire, cordless phone monitoring antenna. The six page guide contains all the instructions and diagrams that you'll need. And here's the best part. The plans are free! It's my way of celebrating the arrival of spring.

To receive your free cordless plans, send a #10 business envelope with \$.58 cents postage to the Scanning Report, P.O. Box 98, Brasstown, NC 28902. If you don't want your plans folded, send a 9 x 12 envelope with \$.75 cents postage.

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Digital programmable 200 channel hand held scanner with raised button keyboard for easy programming of the following frequency ranges: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-956 MHz. Features include: Scan delay, memory backup, key pad lock, sidetalk liquid crystal display, channel lockout, 10 twenty channel banks, direct channel access, automatic search, full one year factory warranty, 10 priority channels, Ni-Cad battery pack, AC adapter/charger, flexible rubber antenna carry case are all included. Size is 2-11/16" W x 1-3/8" D x 7-1/2" high. (Optional extended 2 yr. warranty \$29.99, 3 yr. extended warranty \$39.99.) (* Excludes Cellular)

#CC-008 Heavy Duty Leather Carry Case. \$27.99

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BEARCAT BC100XLT	159.99	(7.00)
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BEARCAT BC142XL	94.99	(7.00)
BEARCAT BC147XL	99.99	(7.00)
BEARCAT BC200XLT	279.99	(7.00)
BEARCAT BC205XLT	239.99	(8.00)
BEARCAT BC310A	85.99	(7.00)
BEARCAT BC330A	109.99	(7.00)
BEARCAT BC400XLT	99.99	(7.00)
BEARCAT BC560XLT	109.99	(7.00)
BEARCAT BC760XLT	269.99	(7.00)
BEARCAT BC800XLT	249.99	(8.00)
BEARCAT BC855XLT	186.99	(8.00)
BEARCAT BC950XLT	249.99	(7.00)
COBRA SR901	74.99	(6.00)

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COBRA CB Radios..... In Stock
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Power Supplies..... In Stock

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RELM UC202 (2 or more)	129.99	(6.00)

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UA502A	12.99	GRE9001	89.99
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BP70	16.99	FBE	5.99
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Covert Techniques	9.95
Tomcat's Big CB	13.95
World Radio	18.99
Survival Directory	6.95
Rail Scan	7.95
Police Call	8.69
Scanner Modification	17.99

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SPECIAL PACKAGE DEAL \$339.99

(Plus \$9.00 Shipping Each)

16 channel digital readout two-way radio. Covers high band frequency range of 148-162 MHz without retuning. Perfect two-way radio for ambulance, police, fire, tow trucks, taxis, commercial companies who use this band. Features include CTCSS tones built-in, priority, 25 watts output, channel scanning, back lighted keyboard, message light, time out timer, scan delay external speaker jack. Size is 2 1/4" H x 6 1/2" W x 10 1/4" D.

SPECIAL PACKAGE DEAL includes RH-256NB, mobile microphone, 1/4 wave body mount antenna, mobile mounting bracket and mobile power cord all for the low price of \$339.99

UNIDEN BEARCAT BC-400XLT



\$99.99

(\$7.00 shipping)

Our best selling mobile scanner, 16 channel, AC/DC, programmable, digital, AC/DC cords, telescopic antenna, mobile mounting bracket, weather search, priority 29-54 MHz, 136-174 MHz, 406-512 MHz, external speaker and antenna jack.



BEARCAT BC-100XLT

100 Channel Digital Programmable Hand-Held Scanner

\$159.99

(\$7.00 shipping)

Our best price ever on a full featured complete package hand-held scanner. Manufactured by Uniden. Features include 11 bands of weather, aircraft, public service, trains, marine, plus more (29-54 MHz, 118-174 MHz, 406-512 MHz), 10 channel banks, 10 priority channels, lighted LCD display, earphone jack, channel lockout, AC/DC operation, scans 15 channels per second, track tuning. Special package deal includes following accessories: AC adapter/charger, rechargeable Ni-Cad battery pack, flexible rubber antenna, carry case.

SANGEAN ATS-803A

SHORT WAVE RECEIVER

\$168.99

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AM/FM/LW and 12 shortwave bands plus FM stereo, BFO for SSB reception, clock radio. Includes AC adapter, telescopic antenna, stereo headphones, and shoulder strap.

BEARCAT BC-147XLT

16 CHANNEL BASE SCANNER

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(\$7.00 Shipping)

Programmable, digital, AC/DC operation. Frequency coverage 29-54 MHz, 136-174 MHz, 406-512 MHz. Weather button, priority, lockout button, squelch includes AC adapter, telescopic antenna.

SPECIAL!!

LOWEST PRICE EVER FOR A PROGRAMMABLE SCANNER



SR-901

AVAILABLE ONLY FROM SCANNER WORLD

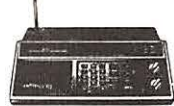
ONLY! \$74.99 Each

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\$69.99 (2 or more)

Features include: 10 programmable channels, one touch memory programming, external speaker jack, 29-54 MHz, 136-174 MHz, 400-512 MHz, squelch, lockout, full frequency digital readout, AC or DC operation, retains memory up to 3 days without power, scan button. Includes AC adapter, telescopic antenna, and complete operating instructions. Size: 7 1/4" W x 2" H x 7 1/4" D. One year factory warranty. (Optional mobile cigarette lighter cord #901MPC \$4.99)

UNIDEN BEARCAT BC 800XLT



DIGITAL BASE SCANNER

\$249.99 (\$8.00 Shipping)

Receive police, fire, ambulance, cordless phones, marine, trains, weather, ham, stock cars, public service plus much more. Frequency coverage 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-912 MHz (continuous), 40 channels, AC/DC operation, digital programmable, memory backup requires 2 AA batteries (not included), telescopic antenna included, AC power cord included, external speaker jack, external antenna jack. Dimensions: 9 1/4" D x 4 1/2" H x 12 1/2" W. Channel lockout, direct channel access, scan delay, priority, digital display, auto weather button, automatic search, track tuning.

UNIDEN BEARCAT BC-950 XLT



\$249.99 (\$7.00 shipping)

Digital Programmable 100 Channel Scanner

BC-950 XLT covers the following frequencies: 29-54 MHz, 118-174 MHz, 406-512 MHz, 806-954 MHz (excludes cellular). Features compact size of 6-5/16" W x 1-5/8" H x 7-3/8" D, scan delay, priority, memory backup, channel lockout, bank scanning, key lock, AC/DC power cords, telescopic antenna, mounting bracket supplied, one year factory warranty, search, direct channel access, track tuning, service search including preprogrammed frequencies by pushing a single button for police fire/emergency, aircraft, weather, and marine services plus exclusive optional features never available on any scanner before. First is an RF receive amplifier for boosting weak signals for only \$34.99 plus a CTCSS tone board is available for only \$59.99 to make this the number one scanner available in the USA. Optional cigarette lighter plug #950 MPC \$4.99.

UNIDEN MR 8100



SPECIAL SALE PRICE \$289.99

ONLY (\$10.00 Shipping Each)

100 channel digital programmable mobile scanner, turbo scan up to 100 channels per second, lockout, priority, built-in automatic 2 second delay, dimmer control, back lighted keyboard, track tuning, direct programming of frequencies from front keyboard plus you can also program MR 8100 from your IBM compatible PC computer with software and cables included with scanner from Scanner World. Frequency coverage: 29-54 MHz, 118-174 MHz, 406-174 MHz, 406-512 MHz, 806-956 MHz. Dimensions: 7.9" W x 5.8" H x 1.9" D. Earphone jack, BNC antenna jack, DC power cord, mobile mounting bracket, internal memory backup, bank scanning, 10 banks of 10 channels in any combination.

MODEL: FB-911 ORIGINAL FIRE BOX PHONE

\$54.99 (\$5.50 Shipping Each)



13 memory phone, 3 direct access emergency memories, auto redial, ringer on/off, top light flashes when telephone is ringing, tone/pulse switchable, desk/ wall mount, front door closes for authentic fire box appearance, FCC approved. Size: 16" H x 8 1/2" W x 7" D.

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GLASS MOUNT ANTENNAS FOR TRANSCEIVERS

Includes mounting kit and cable. Low Band, High band and UHF band include PL259 connectors. 800 cellular band antenna includes TNC connector.

GM-27 27 MHz Low Band for CB	\$39.99	(\$4.00)
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Beginner's Guide to Clubs

Groucho Marx once said "I would never join any club who would have someone like me as a member." Well, you can forget that attitude when it comes to radio clubs; getting involved in one can be a big part of your monitoring hobby.




Radio monitoring is, by nature, a solitary pursuit. But we H.Sapiens are a gregarious lot, so finding an excuse for gathering together to share the radio hobby is natural. The continued success of the Monitoring Times Convention is a good example—many folks are already making their plans to rendezvous in Atlanta in October.

Radio clubs have been around almost since the days of Marconi. The American Radio Relay League (ARRL) was formed as early as 1914. If you have been following the "Club Circuit" column in the back pages of *MT*, you are keenly aware of the dozens of radio hobby clubs out there. For beginners, especially, taking the leap into the club scene opens another new horizon.

What Sort of Clubs Are Out There?

There are clubs that address every aspect of the radio hobby. Shortwave, scanner, broadcast band, amateur band, satellite. Whatever group of frequencies gets you excited, you will find a group of interested fellow travelers. Particular aspects of the hobby are also addressed by clubs. Utility DXing, pirate radio and regional VHF monitoring have their own specialized groups. Those of us who love to tinker and restore old receivers can also find clubs that share this interest. So the best place to begin is to take a look at what aspects of the monitoring hobby turn you on. From this self-evaluation you can then try to find a group or groups of folks that are kindred spirits.

Monitoring Times takes on some of the leg work of club hunting. As I mentioned earlier, the "Club Circuit" column is your first place to check for groups who share your interest. If you are a regular listener to any of the DX programs that are broadcast over many shortwave stations, you will often hear various clubs mentioned. Computer bulletin boards, both local and national, often have message areas devoted to the radio hobby. You can check these BBS's for club information. If you were introduced to the hobby by another rabid enthusiast, no doubt you have already been told about a few clubs dedicated to your areas of curiosity. One other resource would be to ask around at your friendly neighborhood electronics supply store. This might be especially useful if you are trying to locate information on ham radio groups.



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Clubs come in all sizes, from a half dozen locals who gather to swap stories, all the way up to international organizations with full time staff. Each club will vary in the information and services it provides its membership. Many clubs offer brochures, sample newsletters and trial memberships. These provide the potential member with the opportunity to "test drive" the club before committing time and funds to full membership. Let's take a look at the things you might expect from a club when making your comparisons.

Affiliation

This goes back to our gregarious nature. Joining a club gives you the opportunity to connect with a group of people with similar interests. Like any non-radio based organization, many clubs offer symbols, patches, stationery, etc. that allow you to identify yourself with the group. When you walk through a hamfest or a gathering like the *MT* convention wearing your club patch, you are likely to attract a few folks who are also members of the same group. If you are a ham or swl that uses QSL cards, it is common practice to include your club affiliations on your cards, as I do on my card pictured above.

Smaller, local clubs will have meetings where you can get into eyeball-to-eyeball discussions of the hobby. Larger regional and national clubs will gather one or more times a year at conventions. As your membership extends over time, you will make friends and associations that can last a lifetime. When my wife and I were married, we received congratulations from the members of the Willingboro Area Repeater Group over our two meter transceiver as we rode along in the wedding car. My sons' births were announced in *The National Radio Club's* publication *DX News*. Club membership provides the sorts of memories that last a lifetime.

Information

The club serves as a way of sharing and distributing information that is useful to everyone involved. Most radio clubs' very existence centers on a newsletter, journal or magazine. These publications serve as clearing houses of information. Since you are reading *MT*, you must have discovered that our hobby is supported by vast quantities of information that changes at a rapid rate. The search for new contacts, frequencies and stations is never-ending. It is also part of the fun of belonging to a radio club.

Suppose you are tuning through the 41 meter band one night and you hear Radio Freedomia broadcasting on a frequency that is not listed in *MT's* "Shortwave Guide." This frequency change is important information. Of course, we hope you will send the logging in to Gayle Van Horn for her "SW Broadcast Loggings" column. But you will also want to share this information through your club newsletter. Your personal loggings, along with those of all the other members of the club make up an important base of information that will help you in your quest for those rare stations.

Success in broadcast band (BCB) listening and logging often depends on specially arranged DX tests. These are usually set up by BCB club members. You might arrange a test at your local AM station that will allow your fellow club members across the country to log your state. Likewise, your fellow members are doing the same for you in distant parts of the nation.

Amateur radio clubs are responsible for sending groups of hams to operate from rare locations. Ham clubs also serve as clearing houses for information about DX stations and can even serve as QSL bureaus, facilitating the confirmation process.

The key to the success of any club is continued participation by its members. Volunteering your loggings and your time will make the clubs you choose to join more successful at sharing information.

Education

As a beginner, you are no doubt trying to learn all you can about your areas of interest. Most club newsletters publish articles that will help you in mastering the monitoring art. Often these articles are available as reprints or in collections so you can build up a learning library. Some clubs even make available publications geared to the novice to help them become more effective listeners and club members. These articles are written by your compatriots. As you grow in your knowledge and participation in the hobby, putting together an article or two for your club publication is a great way to get started in radio hobby journalism.

As I mentioned earlier, clubs often have get-togethers and conventions. These gatherings usually have forums or discussion groups on topics that will make you a better listener. These educational opportunities are led by people who have been identified by your peers as experts in one or more aspects of the hobby. Taking advantage of these meetings is time well spent by anyone just starting out in monitoring.

When shopping for a new receiver, club publications help you discover which pieces of equipment are optimized for your kind of listening. For instance, a receiver that has a good history of use by shortwave broadcast listeners may be substandard for use by a medium wave broadcast listener. Clubs regularly publish articles on the equipment that works best for the kind of listening their membership does. This can save you far more money than the cost of membership.

Many clubs also publish listening aids, such as maps and log books. Again, these are usually geared to the areas of the hobby that are of interest to club members.

Competition

One of the rewards of club membership is recognition of your listening efforts by folks who really appreciate your accomplishments. This begins when you start to send in your loggings to the club newsletter. Some clubs have special recognition for regular contributors. Many radio clubs have extensive award and certificate programs. These awards serve as milestones in your listening career. A shortwave club will often issue a certificate for your 25th, 50th, 75th and 100th countries verified. Awards are often topical. For example, a club might offer an award for logging 25 countries in South America. If you want to wallpaper your listening post, make sure you check into a club's awards program.

Service

Think of this as giving something back to the hobby. Some clubs' activities include fund raising to provide hobby equipment for disadvantaged folks. Many amateur radio clubs devote a portion of their time to using their communications

expertise to help out with community activities and events. Local clubs often bring the hobby into the school system to give kids a unique view of the world that only radio monitoring can provide. How a club reaches out to the world around it is a good indicator of where its heart and soul is.

You Say You Want More?

Suppose you have a burning interest in some aspect of the hobby and you just can't find a group that meets your needs. There is no reason on earth you can't start up your own club. About ten years ago I wanted to find out more information about repairing and restoring the Collins R390A receiver. I started up a club called "The R390 Users Group." I mentioned my idea for the club in a couple of other club magazines. Within a month there were 75 members who started sharing ideas that have helped to keep many fine old radios up and running. This club has since become known as *The Hollow State Newsletter*, and its current publishers share information on all kinds of tube type communications gear.

The last few years have shown a growth in the area of local monitoring clubs. Taking an example from the amateur radio community, shortwave and scanner folks are grouping all over the country. Sharing the hobby on the local level is hard to beat. You will be surprised how many people out there really enjoy the radio hobby.

Forming a local group is fairly easy. Check with your town hall, public library, schools and places of worship to find out if you can get a place to meet. Then, just put up a few posters in your area electronics supply stores. *Monitoring Times* will put a one-time notice in "Club Circuit" if requested. If you can spare a few hours a week and are long on enthusiasm, you should have no trouble finding some folks to congregate with.

Becoming a Great Joiner

Once you have picked over the lists of clubs and found a few you really want to join, don't forget that membership has its responsibilities. As I mentioned before, most club publications count on you to be a regular contributor of loggings, QSL reports, even articles and equipment reviews. Do your part. If your club offers get-togethers or conventions, take the time to participate and support these events.

Once you get involved and start having fun, don't forget to do your part to increase the membership. You can invite your friends to share in the hobby and the club experience. Or, you could have a couple of kids and raise them right into the hobby scene... You can even announce their births in the club journal!

MT

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- ☐ **Limited Space SW Antenna Solutions \$10.95**
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Monitoring Gizmos and Gadgets

Thumbing through the pages of *Monitoring Times* we all have come across the advertisements for the little electronic black boxes that promise to open up new monitoring worlds. One of the latest to have caught many a monitor's attention are frequency counters. Many of us would like to know how they work, but don't want to shell out the big bucks just to try one out. In this month's Fed File we will take a closer look at frequency counters and will try and clear up some of the confusion surrounding them.

Can You Count On Counters?

Frequency counters are a standard piece of test equipment and are considered an invaluable tool by radio technicians. They have become increasingly popular with monitoring enthusiasts since firms like Optoelectronics have been advertising them in scanning magazines. Many monitors have purchased a frequency counter thinking it will just snatch those hard-to-find communications out of the thin air. Unfortunately, many counters are returned because monitors find out they just don't work the way they imagined.

Although they have some exciting applications that can be applied to monitoring, they aren't the super-sensitive-signal-seekers that everyone thinks they are. Some monitors have the idea that they can install a frequency counter in a car, hook it up to an external antenna and drive around town intercepting all the active frequencies in town. Monitors soon realize that this isn't

the case when the counter only seems to flash a random series of numbers that don't mean anything, and soon the counter ends up in a desk drawer or returned to the manufacturer.

However, many monitors have found out that when they understand both the advantages and limitations of frequency counters and also how to use them correctly, they do indeed live up to a radiohobbyist's expectations. To understand how to use a counter we first have to understand what it is and isn't.

What it is, is a very low-sensitivity, wide range, RF frequency detector. What it isn't, is a radio receiver. Counters were originally invented for use by radio-technicians to calibrate the frequency output of transmitters. This is accomplished by hooking the frequency counter directly to a transmitter or by standing close to the transmitting antenna. When the transmitter is keyed, the frequency counter will display the exact frequency of the transmission.

Monitors can use a counter to find an unknown frequency of a transmitting station in close proximity to the counter. For example, let's say you are attending an airshow and you want to know the frequency that the FAA is using to communicate with the airshow acts.

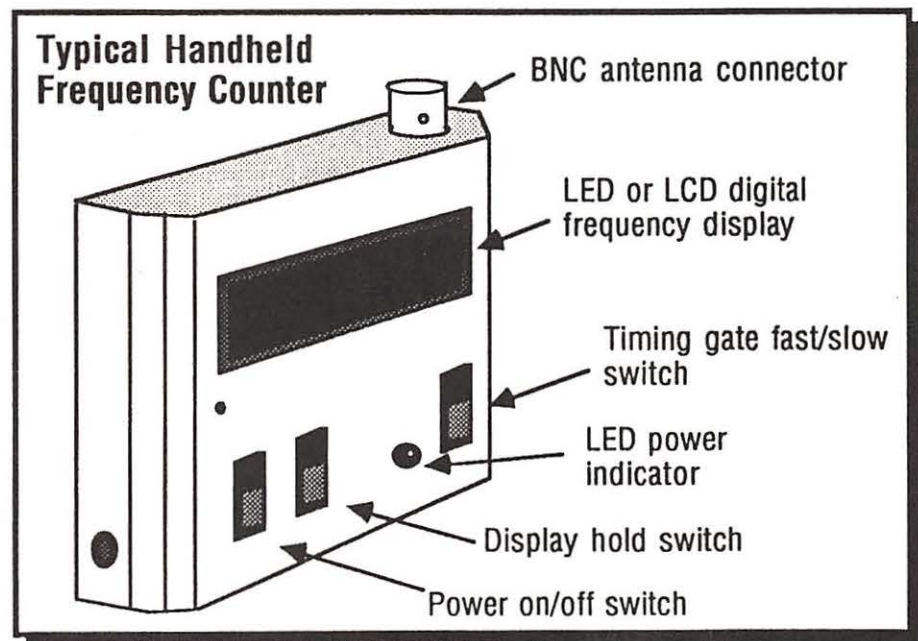
Usually at major airshows, the FAA will set up a communications trailer that serves as a command post. If possible, get as close as you can to the transmitting antennas and turn the frequency counter on. The counter will begin to flash random frequencies as it samples the air-

waves. These numbers mean nothing and should be ignored. The counter is just sampling the available RF. Don't despair. Using a frequency counter is a lot like fishing; you'll definitely know when you get a bite. Watch the counter closely. When the transmitter keys for more than five seconds, the counter will stop flashing and will display the frequency in use. Quickly press the hold button and jot down the frequency. It is as simple as that.

Keep in mind that you have to be close to the transmitter for the frequency counter to work. High powered transmissions can naturally be picked up by the counter from a greater distance, but most of the time you should be within thirty feet of the transmitter. In some instances I have been as far as a city block from a high powered police transmitting antenna and still have been able to get a reading, but in most cases it is better to be much closer. With flea powered transmitters, such as cordless phones or baby monitors, it is necessary to be within a few feet to get a reading.

Other instances in which a frequency counter is useful is in detecting body mikes and covertly placed eavesdropping devices. I also know a police reporter who uses his counter at SWAT stand-offs to find the cellular phone frequency the hostage negotiators use when trying to talk a suspect into surrendering. Though I would caution you against trying the same trick, a counter can be used to find out the frequency of any transmitter to which you can get close.

In any event, a frequency counter can become a valuable monitoring tool when used correctly and when both its use and limitations are better understood. Next month we will take a closer look at another electronic gizmo that many monitors are talking about—the near-field transmission interceptor.



Mailbag

FLTSATCOM Positions

From England and Geoffrey Falworth (editor of *Satellite News*) comes this information which is sure to be of interest to FLTSATCOM monitors. Geoffrey sent us this list of the FLTSATCOM spacecraft and their geosynchronous orbits.

If you would like to more about *Satellite News*, you can write to Geoffrey Falworth, 15 Whitfield Road, Penworth, Preston PR1 0XJ, England. To help with postage, enclose \$1 or 2 IRCs.

Too many antennas on your car? You may find yourself in the unenviable position of explaining yourself to the authorities. The possession of one or more radios in one's car seems to constitute "suspicious activity."



FLTSATCOM1 (1978-16A) positioned at 14°.44 West Only partially operational.

FLTSATCOM2 (1979-39A) maneuvered out of geostationary orbit. Not operational.

FLTSATCOM3 (1980-04A) positioned at 169°.54 West drifting 0°.16, operational.

FLTSATCOM4 (1980-87A) positioned at 171°.60 East, operational.

FLTSATCOM5 (1981-73A) maneuvered out of geostationary orbit. Not operational.

FLTSATCOM6 failed in orbit.

FLTSATCOM7 (1986-96A) positioned at 99°.49 West, operational.

FLTSATCOM8 (1989-77A) positioned at 22°.27 West, operational.

Guilty Because He's a Monitor

Regular Utah contributor Richard Ashley writes us with disturbing news for monitors who like to take their hobby on the road. Richard was driving on Interstate Highway 15 about 30 miles south of Salt Lake City when he encountered car trouble. Richard pulled his car off the road and was attempting to fix the problem when a Utah Highway Patrol car pulled up behind him.

Richard goes on to say, "I explained what the problem was and that I could fix it and thanked him for his help. However, the officer then took notice of my ICOM 02AT 2 meter handheld, my Yaesu FT 757 HF rig, a scanner, frequency counter, and my ICOM 2 meter mobile rig. At this point the officer wanted to know what I was doing with all the "sophisticated communications gear."

"He then demanded that I produce my driver license and proof that I was the lawful owner of the vehicle and its contents. I was also ordered

to produce an FCC license to operate the equipment or it would be confiscated. I offered the officer a photocopy of my Ham license with my call (N51ZC) but that wasn't sufficient!

"The officer informed me that I could very well be a drug runner, dealer or involved in criminal activity because normal people don't generally have so much radio gear in their vehicles. I was let go after being detained for over an hour, but before I was released I was told I would be investigated more thoroughly, especially in light of the fact that my PRO-2006 and my ICOM 02AT could receive police and law enforcement frequencies."

Richard and other monitors have reported similar experiences from officials who are ignorant not only of radio hobbyists but of the laws surrounding monitoring. The officer in question had no right or justification to demand to see an FCC license. Only the FCC has the authority to enforce laws concerning the airwaves, so the patrolman was 'way outside of his jurisdiction. Since it seems that the officer had no reason to believe that a crime was being committed by Richard, it is well within Richard's rights to file a complaint with the patrolman's superiors.

It's a good idea for all of us who might find themselves in a similar situation to be aware of the local laws concerning mobile monitoring. Maybe it is time we educate public safety officials to the fact that just because you own a scanner it doesn't mean you are a criminal.

In fact, time and time again monitors have actually helped in the apprehension of criminals because of their "eavesdropping" skills. They tend to be more aware of both the criminal and police activity in their towns. Just as military monitors have the tendency to be aircraft buffs, public safety monitors tend to support their local police departments.

It was painfully obvious to us (and Richard) that the Utah police officer was ignorant of the laws surrounding ham radios and monitoring, but as it applies to us it also applies to the patrolman: *ignorance of the law is no excuse!*

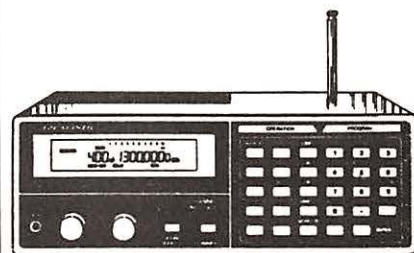
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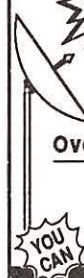
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Shanwick Welcomes a DXer

We interrupt our regularly scheduled flight to bring you a special feature. Welcome aboard and fasten your seatbelts! We are going to have a look at Shannon Aeradio—also known as “Shanwick”—courtesy of David Eason, who visited there late last summer.

It all started last winter when David was reading Gayle Van Horn's QSL Column in *MT* and came across an entry from a reader who received a QSL from Shanwick; also included was their address in Ireland. It so happened that David and his wife were planning to attend a wedding in Dublin late in the summer. David thought that this would be a perfect opportunity to also try to visit the station he's monitored for so many years.

He wrote a letter to Shanwick, asking permission to visit and received an invitation from the Systems Manager, Patrick O'Reilly, saying they'd be most welcome. David and his wife took an Aer Lingus flight from New York to Shannon — SHAMROCK #111, a 747-200.

He had composed a brief message to the captain on the day of the flight explaining that he was an aviation enthusiast and especially enjoyed monitoring the HF aero frequencies. That letter prompted Captain Paddy O'Shaugnessey to invite him to the flight deck where he also met the First Officer and the Flight Engineer, was provided with a radio headset, and spent the rest of the flight seated behind the captain! David tells the rest of the story:

“At this time (0500 UTC) it was just before daybreak at 53° North, 25° West, and we were being worked by Shanwick on 2872. The First Officer was preparing to give his final HF position



David Eason with Don Carney (note QSLs on window ledge).

report at 20° West, prior to contacting Shanwick on VHF radio.

Just then, dawn was breaking and it was the thrill of a lifetime to see the outline of the Irish coast at 37,000 feet from the flight deck of a 747. I was beginning to think that the captain would soon be pleasantly asking for me to return to my seat, but this was not to happen! ATC requested that we begin our descent and the captain began his pre-landing check list. Surely, I would be asked to leave now...

Not so. We passed over the coast and the small town of Foynes which, by coincidence, was the last stopping point for the old Pan Am Flying Clipper planes before they departed for New York. The Flight Engineer pointed out the runway lights to me, some 10 miles in the distance. I could not believe that I was going to be in the cockpit for the landing!

The Captain was busy with the checklist and the First Officer was speaking to Shannon

Approach and then the Tower, while lowering the landing gear. We crossed the outer marker and the runway was coming up quickly. Down to 2,000 feet, 1000 feet, 500 feet over the threshold and to a very smooth landing. I was wondering what my wife was thinking about where I was. She had been asleep when I began this odyssey!

As we taxied to the gate, I really got the feeling of how high off the ground the flight deck is of a 747. Thanks to all the crew and a tip of my hat to Aer Lingus Airlines and to their dedicated staff, especially to Captain O'Shaugnessey.

After a trip to the flying boat museum in Foynes, and a well-needed sleep to overcome the time change, we were off to try to find Shanwick Aeradio's communication station, which is located in Ballygirreen. Incidentally, the name “Shanwick” is not taken from a town, but is a combination of *Shannon* in Ireland and *Prestwick* in Scotland. It was not easy to locate, as road signs are few in Ireland. However, after we were outside the town of Ennis, we finally located the ‘lane’ we were to turn on and, as we just crested a hill, the antennas came into view.

We pulled up in front of the building and entered, thinking we would find a receptionist or some type of security guard. Not so! We wandered into what turned out to be the break room for the operators and were met by one of the staff. My first words to him were, “Is this Shanwick?” and his reply was “Yes, this is what they call Shanwick.” You would have thought I'd died and gone to heaven; after all those cold winter nights listening to the voices of the Shanwick operators, I was now standing in their building just yards from the consoles themselves.

My greeter escorted me to the office of the senior person in charge, Mr. Don Carney, who would be our tour guide. Mr. Carney proved to be one of the nicest persons we encountered during our stay in the Emerald Isle. We were first shown the VOLMET Room which contained the computer software and equipment which broadcasts the aviation weather at H00+25 and H30+55 minutes each hour on daytime frequencies of 5505, 8957, and 13264; and on nighttime frequencies of 3413, 4404, and 8957.

We then proceeded into the Control Room. What a thrill it was to now visualize what had been up until now only a voice over the radio! Mr. Carney explained the various positions. For example, most of us know that the North Atlantic has what they call “Families of Frequencies,” each family having at least 3 and usually 4 or more HF air-to-ground frequencies. Consequently, each desk position corresponds to a frequency family, and each one has two operators.



North Atlantic Traffic Control (NATC) operators at work.

I use the word 'operator,' not controller, as it is not the responsibility of these men to 'control aircraft.' What they do is to receive aircraft position reports and relay them via telephone line to Prestwick, Scotland, where they are entered into the ATC computers so they can be "tracked" according to their flight plan. [This is similar to the way that NY ARINC relays position reports in their area to New York Oceanic ATC, jb]. As you know, there is no radar coverage over the Atlantic, and controllers in Prestwick, Gander, (and New York) rely on the position reports pilots transmit to the aero radio operators to confirm position, flight level, and other related navigational information. There is also a VHF desk utilizing the frequency of 127.9 MHz that is used when aircraft come into VHF range.

I was allowed to sit at one of the positions and was given a headset to allow me to listen to some of the communications. Speedbird 175 (London to New York) was noted on frequency 8879, along with KLM, Lufthansa, Air India, Sabena, Virgin, El Al and others.

I don't think Shanwick gets many visitors from outside as they were extremely interested in the fact that someone from Washington, D.C. actually listens to their communications regularly and took the time to pay a personal visit to their facility!

After spending many hours listening to the pilots of the world's largest airlines, my wife nudged me and said it was getting dark. We thanked Mr. Carney for allowing us to visit the station and sharing so many items of interest.

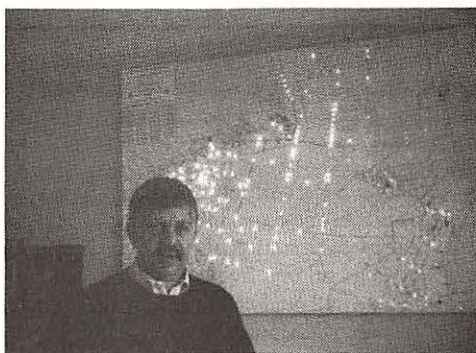
On the day we were to depart Shannon for New York (SHAMROCK 112), I again wrote one of my famous notes to the Captain and — you guessed it — I was rewarded by another visit to the flight deck. This time Captain Jack Fisher played host as he pointed out the various HF/VHF radios and the navigational equipment on board. We also watched a Sabena 747 on an adjacent track, approximately 200 feet above and to the right of us.

The hospitality and interest of these professionals was quite impressive to me and you can bet that our travels take us back to the beautiful country of Ireland, it will be on Aer Lingus."

Thanks, David, for sharing your experiences and photos with us; from the booklet David received at Shanwick, here are their air/ground communication frequencies: 2899, 2962, 2671, 3016, 3476, 4675, 5598, 5616, 5649, 6622, 8825, 8831, 8864, 8879, 8891, 13291, and 13306.

Updates

• Here are a couple of corrections for the last column: I had mentioned that NY ARINC had reactivated 11387 on Car-B. However, when I wrote to ask Dick Covell, Director of ARINC, if



Richard Levenson alongside his North Atlantic Route Chart.

this was a permanent reactivation, he told me that since 11387 gets stepped on by the Sydney VOLMET, they were going to try using 11330 to see if it will work any better.

Also, on the ARINC MWARA frequency chart: there is a typo in the CAR-A column — 2287 should read 2887.

• Next, we hear from Richard Levenson (Manalapan, NJ) who really went all out to enjoy the HF monitoring hobby! He is also a Ham (W2FKN) and an avid shortwave listener. Richard says that his interest — or rather his passion — is monitoring air traffic on a global basis. In his own words, "I wanted some way, (without using a computer) to be able to track flights over the Atlantic without becoming a full-fledged LDOC operator, Air Traffic Controller, or other related type"; although he says he's a distillation of all those and more.

Richard devised a map to track aero traffic over the Atlantic by obtaining a North Atlantic Route Chart, which he had professionally laminated and mounted on a frame. He says "I carefully planned and wired the map with color-coded blinking lights that represent over 100 airports throughout six key regions, including Gander, New York, Piarco, Shannon/Shanwick, Santa Maria, and Dakar. The map uses red, amber, and green sub-miniature lights that run on either 6-volts for position points or 12 volts for blinking indicators (airports). The console also has two clocks for local and UTC time as well as two separate switches to turn on the power supplies to run the nearly 350 lights on the board. The project took two years to complete, or about 10 months of actual construction time."

He adds that when a plane reports its position, he turns on a series of switches and very accurately tracks its flight from one point to another. He can also track hurricanes coming into his area using this system.

Recently, Richard received a write-up in his local newspaper showcasing his hobbies and versatility. Let's face it, folks, it takes a dedicated monitor to develop a project such as the above to enhance the enjoyment of our hobby!

That's all for now. Next time, we'll continue with our look at terminal and enroute radar, book reviews, and a visual explanation of windshear. Until then, 73 and out.

MT

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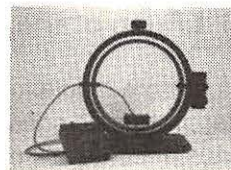
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Better Beginnings

For many, their first introduction to longwave means high noise levels, weak signals, and lots of AM broadcast interference. They have finally taken the step to venture below 500 kHz, only to be disappointed — possibly to the point where they won't return. This is a shame, especially since there are effective ways of dealing with these problems.

You've heard it before — *The most important ingredient to receiving success is a good antenna*. In the case of longwave, this can't be stressed enough. Untuned "random length" antennas commonly used on the shortwaves may not be the best answer for these frequencies. While you may get decent reception in a rural location, they can act as noise collectors in a residential or urban setting. Also, such antennas are usually far too short for the wavelengths involved.

It is possible to improve a wire antenna's performance by using an antenna tuner between your receiver and the antenna. A tuner usually has two controls — one for adjusting capacitance, and another for switching in various coil values (inductance). Depending on the frequency of operation and the length of the antenna, some combination of capacitance and inductance will result in an improved impedance match and stronger signals.

LF Tip of the Month

When using a dipole for LF reception, tie the center and shield conductors of the coax together and reconnect them to the center pin of the radio's antenna connector. This adds electrical length to the antenna and will boost longwave signals considerably.

I don't know of any commercially available LF tuners at this writing, but several homebrew designs have appeared from time to time in hobby publications. Don't confuse a preselector with an antenna tuner. While they, too, can be helpful in combatting interference, a preselector merely blocks out-of-band signals that can overload a receiver, while creating an "open gate" for desired signals. They do not contain impedance matching circuitry.

Directional antennas, such as the Homespun Loop we described here last September, offer big advantages to the listener by being able to turn a "deaf ear" in the direction of interference. Most antennas of this type are small enough for use indoors and are simply aimed by hand to the desired direction.

Another benefit of loops is that you may be able to null out one signal in a "dueling" situation to reveal a weaker station — possibly resulting in two loggings on one frequency. I've used this technique to null out local "pests" so that I could hear weaker DX signals. If you would like to receive plans for building the Homespun Loop, drop me an SASE here at MT, and I'll get it out to you.

LF active antennas are another alternative for noisy environments or for those with space restrictions. They consist of a short whip section (3-5 feet long) attached to a small weathertight box. The box contains a high gain amplifier circuit that makes up for the shortcomings of the small antenna. You'll want to choose the mounting location of an active antenna carefully. Sometimes moving the antenna just 20 feet one direction or another can make a big difference in noise pickup.

Before purchasing an active antenna, make sure it contains circuitry to prevent AM broadcast band overload. This can be a big problem due to the high gain amplifier being used — especially if you live within 10 miles or so of a broadcast station.

There are also outboard filters that can be used with any antenna to eliminate longwave interference from an AM station. Northwest Communication Labs (813 SW Highland, Suite C-310, Dept. MT, Redmond, OR, 97756) is one of the few companies that specializes in such products.

No matter what kind of antenna you're using, there are specific things you can do to reduce noise pickup. First, try to eliminate static sources around your house. Devices suspected of causing noise can be identified by turning them off while monitoring the band.

Light dimmers are often the worst offenders. You may be able to find a brightness setting that will minimize the noise, or, you could simply shut them off during listening periods. Television sets are also a potential source of interference. The circuitry in some sets can generate hash over large parts of the spectrum.

Don't overlook electric motors as a possible cause of noise. A few years back I had an annoying static problem that appeared only during the cooler weather. It turned out that the furnace motor was at fault. Running a piece of ground braid from a ground point to the motor housing quickly cured the problem.

Unfortunately, it's not always that easy. A trick for finding stubborn noise is to use an AM pocket radio as a noise "sniffer." It may lead you to a source inside your house, or to a nearby utility

Beacon Loggings

Freq	ID	Location
205	XZ	Wawa, Ont.
216	CLB	Wilmington, NC
226	EZE	Cleveland, OH
241	INP	Indiana, PA
245	YZE	Gore Bay, ONT
257	YXR	Earlton, ONT
258	ORJ	Corry, PA
318	X	Sandusky, OH
329	CH	Charleston, SC
333	PHN	Port Huron, MI
338	DE	Detroit City, MI
362	AK	Akron, OH
371	TS	Memphis, TN
385	HYK	Saginaw, MI
386	AM	Tampa, FL
393	YB	North Bay, ONT
400	SLW	Wooster, OH
420	RYS	Grosse Pointe, MI

pole where a defective insulator or loose connection could be the problem.

For utility problems, call the power company and ask to speak with someone regarding "radio interference from the power lines." Power companies have people specializing in these types of problems, and they will usually be glad to work with you.

If you are technically inclined, and want to learn more about locating and eliminating Radio Frequency Interference (RFI), you may want to obtain a book on the subject for your shack's library. One inexpensive guide that focuses on interference in receiving systems is the *Radio/TV Interference Book-Sources and Solutions* which sells for \$6.95. This Tiare book is currently carried by Grove Enterprises.

If man-made noise or broadcast interference is not a particular problem at your location, but signals are just generally weak, you may benefit from the use of a preamp between your antenna and receiver. A well designed preamp can provide over 20 dB of signal gain. The LF Engineering Co. catalog lists a popular model that can be installed without any modifications to your receiver.

Their 1993 catalog is free for the asking. This expanded edition includes many new products for 1750 meters, Natural Radio, LF Electronic Countermeasures and AM Broadcast Radio. You can write them at: LF Engineering Co., 17 Jeffry Road, Dept. MT, East Haven, CT 06513, or call (203) 248-6816.

Loggings

Dave Christner of Cortland, OH, writes to say that he's "gone ahead and done it" — he's tuned the dial below 500 kHz for the first time! Using his ICOM R71A and an antenna strung in his attic, he came up with an impressive list of loggings, many of which appear above. Welcome aboard, Dave.

See you all next month!

MT

All through April's showers and May's flowers, Grove is here for you!

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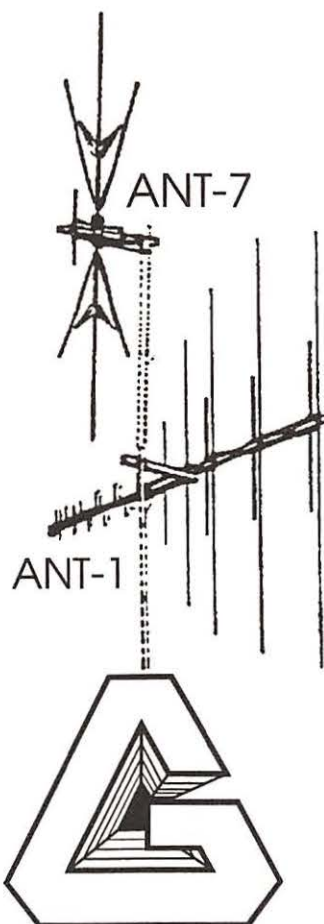
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DecalcoMania!

de-cal-co-ma-nia (noun) 1: the art or process of transferring pictures and designs from specially prepared paper (as to glass.) 2: a club for collectors of bumper stickers, T-shirts, hats, mugs, key chains, magnets, coverage maps, hit music surveys, air checks, sales presentations, and other promotional items from radio stations. 3. Lots of fun for anyone who loves radio.

"We collect just about anything with call letters on it." DecalcoMania publicity manager Paul Richards describes this unique club: "It's a mixture of people who are in radio and also enjoy it as a hobby, and people who don't actually work in radio, but live and breathe it anyway."

DecalcoMania members collect promotional items like DXers collect QSL cards. "Generally, people like to get one sticker from each station and then keep them current with new stickers."

One way to build a collection is to go to the source. "Some members write to stations and ask if they have stickers. If they do, they ask them to send half a dozen to them. Often people will call stations and ask 'How can I get some of those Gino's Pizza stickers?' and the stations tell them 'Well, you can go to Gino's, or we can send you some.' A lot of people collect them while travelling by visiting stations along the way." A good way to get leads on new stickers is to actually see them on a bumper! If you know they're out there, you know what to ask for!

"Really good stuff appears at the conventions when everybody brings everything they want to swap." The annual Decalcomania convention attracts members from across the country and beyond. Large boxes containing thousands of bumper stickers are shuffled through, as du-

Phil Bytheway's son Tony is stuck on Dave Whatmough's amazing van.



uplicate items from one collection help another to become more complete. "It's a big social event, basically," says Paul. The pace is sometimes furious! "We all swap stories, everyone goes through each other's trade lists and boxes, airchecks are flying about at the same time. Several of us have photo albums of tower sites. One guy even videotapes tower sites!"

Although DecalcoMania conventions usually include good eating, great fun, and baseball, collectors of bumper stickers are serious about their hobby! "The leading collector of stickers was believed to be co-founder Mark Strickert. When he decided to sell his collection it totalled over 15,000 stickers." Nor have you ever seen anything like Dave Whatmough's legendary van! The driver's side is covered with east coast stickers, and the passenger side holds the west coast variety. His Ontario license plates read "AM FM DX!" Dave, what goes on the back and the roof?

Join these experts by reading Decalcomania's "The Care and Feeding of a Promo Collection." It's a comprehensive reference guide designed to maximize your enjoyment of the hobby. Have a sticker you can't identify? Don't know where "Q 94" is? Someone in this club probably does, and you'll find them all in Decal's "UNID List!"

Many club members like to perform as well as listen. Their talents emerge when you play a "Decal-on-Tape" cassette. Three 90 minute homebrew shows have been produced, and a fourth will be released soon. You'll hear bloopers, very unusual little bits of radio, and amazing montages mixed with commentary and humor.

Many DecalcoMania members record radio stations, then swap the cassettes among each other. Now you can enjoy listening to music and talk shows from all over the country without foraging through static and noise! The sounds of out-of-town stations will bring you many kinds of formats and songs not available locally. Older airchecks add an historical aspect to the club. Some offerings go back to the 50s and 60s, although most tapes are current. Periodically, members poll each other to rate the quality and

performance of various brands of cassette tapes ensuring only the best are utilized for airchecks.

Club members keep in touch with one another through the DecalcoMania newsletter published ten times yearly by Phil Bytheway in Seattle, Washington. It's the meeting place for everyone to trade thoughts and lists of their collections. Specialized columns address each aspect of the hobby, like the clever "Stix Tipz," that utilizes an ingenious color code system to precisely identify new bumper sticker releases. You'll also learn about the latest promotional gimmicks and format variations as members monitor the dials in "Chatterbox." Rock 'N' Roll lovers will enjoy the "Musical Time Machine" reproducing top 40 radio lists from years gone by. Paul has noticed that, "In the 60s and 70s, the things to collect were music surveys. At the time there were lots and lots of AM stations who distributed them. In the 80s, stickers became the things to collect."

All kinds of goodies are available to the highest bidder in DecalcoMania's auction column. Everything imaginable is offered to raise money for the club, for example, "the medium-sized WLS T-shirt that fit at 16 and no longer does at age 25."

"A lot of our members are also into contemporary music," Paul notices. Once a year DecalcoMania conducts an annual music poll. Everyone plays rate-a-record from a list of all the hits that made *Billboard Magazine's* 20 in the past year. The winners are published in DecalcoMania's newsletter.

Paul moonlights as a modern rock disk jockey on WFDU 89.1 FM in Teaneck, New Jersey, early Thursday mornings between 0115 and 0600 Eastern time. WFDU broadcasts from the historical tower erected by FM pioneer Major Edwin Armstrong, on the palisades of the Hudson River in Alpine, New Jersey. The entire New York metropolitan area can hear Paul spin his tunes.

Want to join a club you can really get stuck on? Send an SASE today to: DecalcoMania, P.O. Box 126, Lincroft, NJ 07738.



The trading begins at the 1992 convention. Left to right: John Clemmer, Dave Whatmough, George Greene, Mark Strickert, Marvin Schultz.

Be an American BandScan Reporter.

See any stories about radio in the local paper? Send them to Monitoring Times, PO Box 98, Brasstown, NC 28902.

Bits 'N' Pieces

• The feeling's good at Mutual! Larry King is getting more sleep now that his talk show is broadcast in the afternoon instead of the graveyard shift. 363 stations broadcast his first daytime show in February, breaking all records for a new venture on network radio. Frequent King fill-in Jim Bohannon now hosts Mutual's overnight show and has held on to almost every station that formerly carried King. Larry celebrates 36 years on the air next month! Congratulations!

• Every Tuesday morning you can hear a net of ABC employees on 7180 kHz. Tune in around 9 am Eastern time for an interesting rag chew hosted by Harold Gordon W2RLG, Dick Aronson K2RVM, Joe Brady W2SLF, and Ed McCabe W2AMP. Feel free to drop in and join the fun!

• You need big bucks to buy a radio station in New York City! Country formatted WYNY, 103.5 FM, has just been sold for a cool \$50 million in cash. Chicago based Broadcasting Partners, Inc. procured the station from programming syndicator Westwood One who is selling assets to work down their debts. They bought WYNY in 1988 for \$39 million. WYNY's format will not change, but popular morning jock Jim Kerr has moved to soft rock WMXV across town. Only one station remains in Westwood One's inventory: Pirate Radio KQLZ-FM in Los Angeles. Westwood also recently sold WNEW-AM in New York City which has now become The Big Apple's third all-news station WBBR.

• The GE Superadio isn't super anymore! For the past ten years the GE Superadio has been the portable of choice for AM and FM DXers. Always a best buy, excellent selectivity and sensitivity could be yours for around fifty bucks. Unfortunately, the new GE Superadio III does not live up to the tradition.

The radio's appearance has been changed to a streamlined all black plastic cabinet, and the classic air-gap variable capacitor tuner has been replaced by a less-expensive all solid state design. The noise generated by the new tuner makes DXing almost impossible. Also, the "wide-normal" switch describes its function well, and makes DXing disappear! "Normal" provides about 6 kHz of audio quality. "Wide" was intended to provide high-fidelity AM. Instead, tuner noise dominates this position. If you are interested in owning a worthwhile GE Superadio, carefully look for a GE Superadio II. They're still in stock in many stores nationwide.

Mailbag

Are you out of work and need some help? If you live near Baltimore just tune in WHLP! Their new format combines employment adver-

tising with talk and advice concerning occupational training, how to prepare your resume, and creating a positive impression at interviews. You'll also learn how to start your own business and improve your income just by dialing in 1360 AM.

Western Star Broadcasting of Chicago hopes to bring this format to 25 or 30 more stations across the country by the end of 1993. Rapid expansion into other cities is possible by leasing time on existing stations instead of buying them outright.

Manager Tom Dore thinks radio classifieds can be even better than newspapers. "If you lose a pizza delivery driver, you can call us and probably get it on the air tonight and hire someone immediately. We put those pieces on the air quickly and do it for a fraction of the cost." A 30 second spot costs between \$15 and \$20. MT reader Bob Mills sent in this scoop from the pages of *The San Diego Tribune*.

International Bandscan

The sunny island of Jamaica now has eight radio stations to choose from. Power 106 has joined the competition, seeking an audience in this happy paradise. *The Daily Gleaner* newspaper owns a majority interest in Power 106, and has recruited a diverse staff of islanders to build interest in the station. Their early morning talk show is hosted by Elombe Mottley of Barbados, Knolley Moses of Trinidad, and David Ebanks, a veteran Jamaican radio news reporter. Together, they present a refreshing and balanced point-of-view concerning events in the Caribbean.

Jamaican listeners also hear the government owned Jamaican Broadcasting Company on AM and FM, along with Radio Jamaica, KLAS FM broadcasting from Mandeville, and Montego Bay's Radio Waves. Reggae lovers devote their radios to Irie FM, the world's only all-reggae music station based in Ocho Rios. Listening in Jamaica is almost as beautiful as the island itself!

Five foreign broadcasters have earned the right to broadcast in the East African nation of Ivory Coast. FM listeners near the capital, Abidjan, will soon hear the BBC, Radio France Internationale, Africa Number One, and two new services: Jeune Afrique Musique and Radio Nostalgie. JAM is the first radio venture of the Paris-based publication Jeune Afrique. Radio Nostalgie is a joint effort of France's Radio Monte Carlo and Ivorian investors. Seventeen radio services vied for the licenses awarded on the basis of financial reliability, technical quality, and programming content.

Thanks to the Associated Press and Reuters News Service for our international news. Until next month, happy trails!

MT

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April 1993

49

A Ku-Band Primer

In February's discussion of Direct Broadcast Satellites (DBS), we mentioned that most DBS ventures involve broadcasting in the Ku-band frequency range (roughly 12 GHz). This month we'll explore this interesting band with an eye toward setting up a Ku system, augmenting your existing C-band dish for Ku reception, and trying to determine if it's even worth your while.

Getting Started in Ku

First, let's assume that it is worth your while. After all, that's a very subjective question, and finding out what you need may help you decide what course you wish to pursue.

Starting at the dish we find that there are a number of things to consider when contemplating Ku reception. First, it must be determined that the reflective surface is tight enough to bounce Ku frequency microwaves into the feedhorn. Some fiberglass and early mesh dishes had holes in the mesh which were too big to reflect Ku wavelengths and thereby made very poor Ku band dishes regardless of their size. All dishes currently on the market are "Ku compatible."

The second thing about the dish is the accuracy of the surface. Again, because the wavelengths are so short, the parabolic curve of the dish must be as true as possible. When buying a used dish look for warped surfaces, misaligned joints, as well as gaps and holes in the mesh. When assembling a new dish, take your time. Careful assembly

is the only way to put a dish together and get it to perform up to its specs.

The third thing to know about the dish is that it should have a fixed feed support. One-legged "buttonhook" feed supports are fine for C-band reception, but Ku requires a much more stable feed. This is why manufacturers are using the three or four leg feed support in today's reflectors. Such supports keep the feedhorn in place over the exact center of the dish where the most gain is received.

Feedhorn and Electronics

Because of its different wavelength it will be necessary to put a new feedhorn on the feed supports. If your dish is to be used for both C and Ku reception, you'll need a C/Ku feedhorn. This device is similar to your C-band-only feed except that it has a port for the Ku LNB in addition to the one for C-band (see photo). A Ku band Low Noise Block Downconverter (LNB) must then be purchased and attached.

This is where you can really spend some money. The latest "state-of-the-art" Ku LNB (.8 dB noise figure) runs around \$400. But it's possible to buy an adequate Ku LNB (1.9 dB) for less than one tenth the price. In addition, a C/Ku feed will cost around \$130. So, instead of coughing up \$530 to get into Ku, you can get in for a lot less. A 1.9 dB Ku-LNB on a C/Ku feed gets you into Ku for a little over \$150.

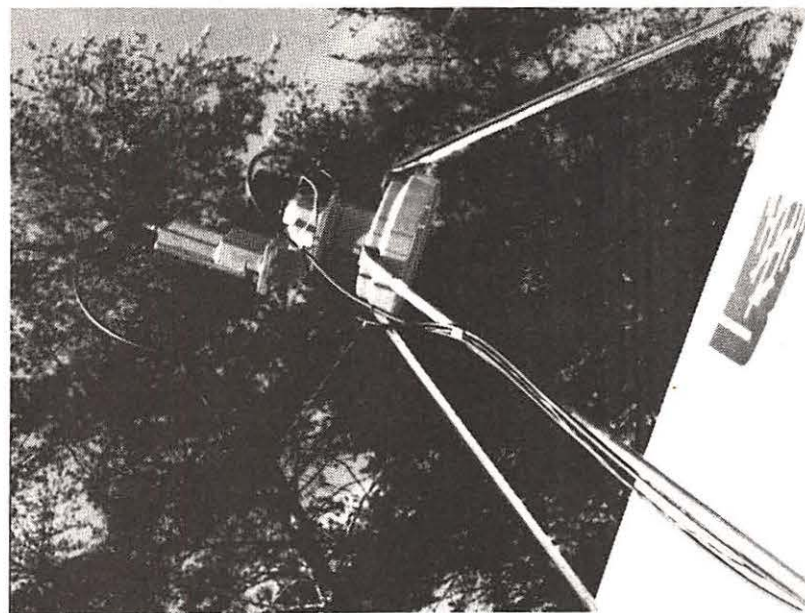


Photo by Ken Reitz

C/Ku feedhorn allows a C-band and Ku band LNB to share the same feedhorn. Note that two runs of RG-58 are used to bring the separate signals to the satellite receiver.

The Ku Receiver

Now, let's go inside and see what we need to complete our Ku installation. For starters, it should be noticed that we are now bringing two signals in from the dish: One from the C band LNB and the other from the Ku LNB. You will have to run a separate length of R-58. You cannot combine the signals with a splitter/combiner.

If you look on the back of your satellite receiver, you may notice that there is room for only one of the LNB cables. Most new receivers have two coax inputs for both LNBs, but older receivers will not. In this case you will need to add an A-B switch in order to switch from one LNB to the other. Don't use those flimsy computer game type switches; you'll need a fairly heavy switch with good isolation between signals.

If you don't add the A-B switch, you can always manually swap LNB lines. When you do this, be sure to turn off your satellite receiver before effecting the change, as both lines carry the voltage to operate the LNBs at the dish. It would be possible to short the conductor against a ground and damage either the LNB or the receiver.

Locating the Ku Birds

Now that you've hooked up your Ku LNB and turned on your receiver, it's time to go hunting for the Ku birds! The easiest way to find Ku satellites is to go to the C/Ku birds, such as the Spacenet series or the new Hughes Galaxy 7. These positions are already programmed into your receiver and will be easy to locate.

The first time you tune in a Ku signal, you'll notice another peculiarity: the signal appears to be scrambled. The fact is that the signal, due to yet another vagary of Ku broadcasting, is sent upside-down. To put the signal right requires a "video inversion" switch. New satellite receivers are equipped with microprocessors, and you won't have to do anything. Most, but not all, older receivers have a switch on the back which inverts the signal. If yours doesn't, you'll have to get another receiver which does.

What's On?

It would be very helpful at this time if you had a satellite TV program guide, as they all list the positions and relative channels of the various Ku satellites. Study this for some time and you'll become aware of a few interesting points—some of these satellites have channel numbers that

don't appear on your receiver. And, if you've tuned to a satellite such as K2, you may also find that the channel numbers in the guide don't correspond to what you're seeing. The reason for this is that there are no set standards for Ku channel frequencies, and all receivers don't tune them the same. This is a challenge you won't find at C-band.

More Ku Mysteries

Another mystery will be that the guide may clearly show a particular channel which simply isn't there. The reason for this is that many Ku satellites have regional "spot beams" which are capable of training their signal on a particular region of the country, leaving the rest out of the "footprint."

Then there's the satellite which appears to come and go... GSTAR 3 is clearly listed at 93 degrees west and carries a number of NBC news channels. Occasionally, when tuning in, the channels are either gone or not as clear. The reason for this is that the satellite is in an "inclined orbit," which means that it is moving slightly in its "slot" in the sky and therefore drifting in and out of your dish's sight. The point of all this is to say that much of what one may think is available, simply isn't.

But Wait, There's Less!

On top of all these other drawbacks, many of the channels which are listed, which aren't in an inclined orbit, which aren't spot beamed, are, in fact, scrambled via encryption systems which are unavailable to customers.

The channels which are in the clear and actually viewable with a TVRO system boil down to this: There are a number of NBC channels (programming and news feeds) which are not found on C band; there are a number of educational institutional feeds such as the Fire and Emergency Television Network (FETN), Cyclesat (a television commercial distribution channel), and a few others; and finally, there are a large number of news and sports feeds which are, of course, unannounced and simply require a channel-by-channel search to locate them. There are considerably more of these same feeds on C-band.

Isn't There Anything Else?

Yes, there are a few Single Channel Per Carrier (SCPC) audio signals, there are even fewer analog subcarrier audio services, and perhaps a couple of other items for those with time to kill. But, for the most part, satellite watchers will be glad they didn't put a whole lot of money into the upgrade. Keep in mind that the real future

of Ku is in the area of DBS broadcasting and, as has been well covered in this column, each of those systems will require their own hardware for reception.

Mailbag

Werner Rueggeberg, N3AKG, of Lancaster, PA, writes that he would like to know what all the abbreviations which are regularly used in this column stand for.

TVRO stands for Television Receive Only and refers to a satellite dish installation which is not used for transmitting, but only for reception of such signals. The FCC used to require licenses for these installations, but gave up the notion when installations exceeded 90,000 per month in the early '80s.

SCPC refers to Single Channel Per Carrier FM audio transmissions which are sent on individual carriers. These are very narrow bandwidth transmissions, and it's possible to put a hundred of them on one transponder (satellite channel). These channels carry no video, and when viewed on a TV screen through your satellite receiver appear to be unused. The purpose of these signals is to provide network programming to radio affiliates which can be located anywhere.

LNA refers to a Low Noise Amplifier which is used to amplify the satellite signal at the feedhorn (the device which gathers the microwaves and directs them to the LNA). In the past, these signals from the LNA had to be sent to a separate device called a "downconverter" to change the microwaves into a more transportable frequency, usually 70 MHz (very high frequencies don't travel well on small cables as the signal loss is too great).

LNB (Low Noise Amplifier Block

downconverter) refers to a newer method of converting the 3 GHz or 12 GHz satellite signals into a "block" of frequencies (950-1450 MHz) that are not only easy to transport to the receiver, but allow more than one receiver to tune the LNA at a time. This method is now the industry standard.

The quality of these LNA/LNBs is determined by the "noise temperature" which is measured at the output stage of the amplifier. This temperature in C-band is expressed in terms of degrees Kelvin (K). In Ku band it is expressed as dB (Decibels). In both cases, the lower the figure, the better the device is thought to be.

Whenever I use an abbreviation in this column, I try to indicate what it stands for. There are many basic acronyms which I take for granted everyone understands. Yet, clearly, there are many for whom this is their first introduction to the subject of TVRO and it's necessary for me to step back and explain some basics. It's also important for readers who are interested in this aspect of the monitoring hobby to dig a little deeper in the subject, and there are a few excellent places to start.

Fortuna Communications publishes the comprehensive *Satellite TV Buyer's Guide 1993*. It has a wealth of information about this subject and a nice glossary as well. You can find it on newsstands for about \$5 or order it directly from Fortuna at (707) 725-6951 or write them at P.O. Box 308, Fortuna, CA 95540-0308. A very authoritative glossary of terms can be found in Baylin Publications' *World Satellite TV and Scrambling Methods* which is available from Baylin Publications at 1905 Mariposa, Boulder, CO 80302 or call (303) 449-4551. This book is \$40. There are others which are more expensive, but this should give you a good start.

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How often have you had a contact ruined by a signal several kHz away spluttering and making the station you are working unreadable? For the most part, there is no excuse for this happening!

The reason for incidents like this is that the offending station is driving his transmitter too hard in an effort to obtain greater output. It is unfortunate that many amateurs see power as the answer to communicating. In truth the answer to reliable communications is using common sense!

FCC regulation states that an amateur station should use only enough power to communicate. Very often that means less than one watt of power! Ninety-nine percent of the time we can carry on reliable communications with less than five watts of power output! One hundred watts is the most power the average station should need. Just because a kilowatt sends a reliable signal to a distant point when conditions are poor, does not mean that conditions are poor 100 percent of the time!

Much of the difficulty of communicating is directly due to stations running high power consistently and not caring who they interfere with (QRM)! One of the most disgusting things heard on the air is a station bragging about how they can crush another station.

What Can We Do?

We can set an example by running low power. When in QSO (contact) with a high power station, tell him you are running low power, and try to talk him into reducing his power so he can see how effective a few watts can be.

Many of today's hams have never tried using low power and are convinced that it is too hard to work stations when power is under several hundred watts. Unless they can be convinced to give it a try, many will simply scoff and move on.

Join one of the QRP organizations and be active in it. There are several clubs that offer a newsletter and sponsor various QRP activities. In my opinion, the best of these societies is the G-QRP club. This club has been active since 1974 and produces an excellent quarterly newsletter called *SPRAT*, which features many excellent construction articles in each issue. Although it is based in England, it is possible to join the G-QRP club via the QRP Amateur Radio Club International (ARCI). Cost is \$12 per year and memberships should be addressed to Luke Dodds W5HKA, 2852 Oak Forest, Grapevine, TX 76051.

If you wish to join the QRP ARCI, send ten bucks for a years membership to the same address. The QRP ARCI is based in the USA and has been in existence since the 1960's. It also has



N3IK's low power station brings in the signals just fine, thank you!

a quarterly newsletter and sponsors activities for the low power addict. Their newsletter is slicker than *SPRAT* and delivers a lot of good material, well worth the ten bucks. The main difference between the two newsletters is that *SPRAT* offers more projects and is a bit friendlier in the way it is written.

Getting Started

Most of today's modern transceivers allow the operator to vary the transmitter's output power. Many of them will only drop the power to ten watts or so; therefore, in order to be true QRP (five watts or less) an attenuator must be added to the output. Other rigs allow power reduction down to about 2 or 3 watts; my Kenwood TS-680 drops to approximately 4 watts output at the minimum power out position.

Several commercial QRP rigs are also available, the most notable being the Ten Tec Argonaut II. It is a super rig with a receiver that is difficult to beat. It covers all bands and works CW, SSB and all other modes, plus it has all the features available on the high powered rigs. Price of the Argonaut II is about \$1100.

The most popular low power commercial rigs are the Heath Series, such as the HW-7, HW-8 and HW-9. Prices vary from 25 dollars up to 200, depending on the model and condition. The HW-7 is limited to 80 - 40 - 20 meters and has a rather poor direct conversion receiver; the HW-8 includes 80 through 15 meters and has a considerably better receiver; and the HW-9 has a superhet receiver and covers 80 through 10. With the optional WARC band kit it covers 30, 17, and 12 meters.

Unfortunately, Heath Kit has gone out of business, and these rigs are now only available as used equipment. All three models are CW only. If SSB is important to you, then consider the older Ten Tec Argonaut which is available from 100 to 300 dollars depending on model and condition.

Of course, it is possible to build some really neat low power rigs. Expect the same kind of results from your home built gear that the commercial stuff produces, but it will seem a hundred times better because you built it yourself! Several good books are out there with many excellent receiver and transmitter projects. Two of the best are *WIFB's QRP Notebook* and *Solid State Design for the Radio Amateur*. Both books are available from most amateur radio stores, but if you cannot find them locally, write to the ARRL, 225 Main St., Newington, CT 06111.

The photo is of the N3IK low power station, used for about 95 percent of the activity at N3IK. It consists of a Heath HW-9 on top, and an Argonaut 509 on the bottom. This station has accounted for over 200 countries on CW and almost 100 (88 confirmed) on SSB.

The 200 countries were worked while using a three element beam antenna. For the past nine months, however, I have worked nearly 100 countries using only a Cushcraft R-7 vertical antenna and a very low to the ground loop antenna. On 75 meter SSB and a grounded loop antenna, this station has worked 35 countries in Europe, Africa, South America, North America and Oceania. Reports are almost always as good as stations using 100 watts of power and seldom more than two S units lower.

Lately, more articles have been appearing on how to operate using low power. In my opinion, these articles do more harm than good. *Good operating practice is the same, no matter if one runs one or one thousand watts.* Being an avid contester, I use exactly the same techniques as I do when running my 100 watt station and results are generally similar. More often than one would suspect, the low power station will break a pile

up and produce scores in the same order as a higher power station.

What to Expect

A five or a 10 watt rig fed into the same antenna will produce remarkably similar results. If you do not announce you are running QRP, you have the same chance as any other station. However, if you sign /QRP, your chances of working the calling station ahead of the high power group go up about 50 percent.

Hundreds, perhaps thousands, of stations running under five watts have worked well over 100 countries and have rag chews lasting for long periods of time, in exactly the same manner as their 100 watt plus brethren.

Confidence in what you are doing is very important no matter what endeavor you are undertaking for the first time. One of the best examples of what confidence can do is illustrated by the following story.

A good friend, impressed with the results I had been obtaining with a Heath HW-8, went out and purchased one for himself. Upon completing the rig, he hooked it to his 80 meter dipole, made a few contacts, and then gave up on QRP, reporting it was too difficult to work anyone with such low power. Consequently, he went back to his full gallon (legal limit) station. He sold the HW-8 to a new ham who lived in a rental property and was not allowed outside antennas. The new owner wrapped a nine foot fishing pole with thin wire and stuck it out of the second story window whenever he wanted to operate and had a ball working stations all over the place.

The difference between the two operators was that one was accustomed to working a station by brute force and getting through on the first call, whereas the second op was happy to operate in a normal manner and had fun working whatever he could. More importantly, the high power station was likely causing interference to countless other stations and disrupting the pleasure of others, whereas the QRP'er did not.

Next time you hear the argument that copying low power is too difficult and low power is a waste of time, try this rebuttal: if other stations used just enough power to get through, then more QSO's (contacts) could take place and more amateurs would be enjoying themselves.

Use witts, not watts!

MT

PLANET (see Feb. issue) now meets on Sundays (1830 UTC on 14.330 MHz) per KDSRO.

Bob Secord's

Ham DX Tips

Just like the National Hockey League has its second season, so does amateur radio, and April is when it begins. The HF contest season is now behind us, but the ham get-together and single operation season is upon us in the Northern Hemisphere, while DX is still abundant for those who are going into winter in the Southern Hemisphere. Here are some tips to help you enjoy this "second season."

BANGLADESH Look for S21ZG, Eric, on 14025 kHz CW between 1200 to 1400 UTC daily. Send your QSL requests to his QSL manager: W4FRU, John Parrott, P.O. Box 5127, Suffolk, VA 23435.

CAMEROON TJ1GG (who has QSL manager I2EOW, Ermino Pandocchi, Via Moretto da Brescia 40, I-20133 Milano, Italy) has been on 28032 kHz CW daily at 1400 UTC.

FALKLAND ISLANDS VP8VN has been on 21005 kHz CW at 2030 UTC most days. Send your QSL requests to: G4LHZ, J.D. Ainge, 55 Oxford Square, RAF Locking, Weston Super Mare, Avon BS24 7DR, England.

GET-TOGETHERS If you are in the Visalia, California, area April 16th to 18th, make a visit to the Holiday Inn and the annual Northern California DX Convention! Many noted DXers and vendors from around the world travel to Visalia each year. Many consider this to be the big DX gathering of the year.

Undoubtedly, the biggest gathering in amateur radio is the Dayton Ham Convention. The 23rd to the 25th of this month, over 35,000 amateurs will descend upon Dayton, Ohio. If it has anything to do with radio, SWling, amateur radio, or computers, you can find it at Dayton! Not only are there vendors and manufacturers galore, a gigantic flea market, as well as many forums (including an annual SWL forum), but many of the noted personalities of the radio world are in attendance (last year I had a very enjoyable chat with Bob Grove).

GIBRALTAR ZB2CF (whose address is: C. McEwen, 12 Kings Bastion, Gibraltar) has been a regular on the 14256 kHz (SSB) DX net at 2330 UTC weekends.

KUWAIT 9K2JC is a member of the Canadian Embassy staff here (QSL to: Canadian Embassy, P.O. Box 25281, Kuwait City, Kuwait) appears on 14195 kHz SSB at 1300 UTC most days. 9K2ZZ (whose QSL manager is: W8CNL, Raymond McClure, 674 Crestlyn Dr., North Augusta, SC 29841) often appears on 14225 kHz SSB at 1300 UTC.

MOZAMBIQUE C9RTC has been on 14083 kHz RTTY at both 0815 UTC and 2230 UTC most days. QSLs should be sent to his QSL manager: IK4QIZ, Box 65, I-47100 Forlì, Italy.

MONGOLIA JT1BG (S. Bator, Box 158, Ulan Bator 13, Mongolia) has been offering this rare DX country on 14200 kHz SSB at 0100 UTC Saturdays. (Note: Some DXers say that if you add "via Japan" to the address this increases your chance of getting a reply).

NETS Maritime enthusiasts might wish to listen to the "Tin Can Sailors Net" which meets every Sunday at 1800 UTC on 14255 kHz SSB. Though the net is for Navy and former Navy personnel who have served on destroyers, you need not have been a sailor to enjoy the friendly discussions found on this net.

PARAGUAY ZP6XD (J. Dean Moore, P.O. Box 2320, Asuncion, Paraguay) has been operating RTTY on 21083 kHz at both 0000 UTC and 1730 UTC.

QATAR A71CW is SP5EXA (Chris Dabrowski, Box 2201, Doha, Qatar) likes CW and has been found often on 18025 kHz CW at 1400 UTC.

SLOVAK REPUBLIC This new country created from the former Czechoslovakia can be added to the RTTY DXers log thanks to OM3LA (Ivan Dobrocky, Gagarinova 16, S-97401 Banska, Bystrica, Slovak Republic, Europe) who is on 14084 kHz at 0930 UTC and 21085 kHz at 1145 UTC.

USA/CANADA US and Canadian amateurs and SWLs who have the equipment to tune into VHF SSB signals might wish to try DXing during the ARRL Spring Sprints this month. The 144 MHz Sprint will be held the evening of the 5th; the 222 MHz Sprint the evening of the 13th; and the 432 MHz Sprint on the evening of the 21st. Look for me (N9LAG) during the 144 MHz Sprint (suggested frequencies are 144.180 to 144.210 MHz) and the 432 MHz Sprint (suggested frequency 432.100 MHz). I hope to contact many MT readers who are amateurs and look forward to receiving reception reports from those readers who are SWLs. If you log N9LAG, please send your QSL requests to: P.O. Box 91, Benton, IL 62812.

That's it for another month, 73 de Rob.

CCC Radio Creates Controversy

The right-wing Voice of Tomorrow's former niche in pirate and clandestine radio has a new occupant. Many of our readers have forwarded information about CCC Radio. Dave Gasque of Orangeburg, SC, first noticed their activity just before Christmas, but many others heard a burst of late 1992 and early 1993 activity from the station. Greg Martin of Fruitport, MI, logged a 7415 kHz example at 0015 UTC, noting that they use a slogan of "The Voice of the Conservative Consolidated Confederacy." Skip Harwood of Beale AFB, CA, says that CCC Radio demanded the release of numerous right wing "political prisoners" in USA jails during one show.

Dave, Greg, and others point out that the station features harshly racist programming, including support for the Ku Klux Klan, skinheads, and "Der Fuehrer." While not as well produced as the V of T or National Vanguard Radio, CCC Radio's program content has been even more startling than its far-right radio colleagues.

The station announces several different addresses and uses alternative identifications at times. But, *MT* reporter Charles Collins of West Allis, WI, reports receipt of QSL #1 from Radio CCC's verification signer Tim Hurper. The valid address used by Charles is PO Box 5635, Longview, TX, 75608. Hurper also sent three fat envelopes containing racist literature from groups such as the White Aryan Resistance and a KKK application form!

Hurper informed Charles Collins that CCC Radio used an amateur radio operator's transmitter during a drunken binge, but DXers have logged at least four broadcasts from the new station on various dates. Charles speculates that the station is an unorganized one person effort, but the multiple transmissions make this conclusion uncertain. We will keep our eyes on this one, since its programming focus goes way beyond the bounds of normal political expression.

RMI Clandestine QSL's

Many DXers have discovered that Jeff White of Radio Miami International is an exceptionally reliable source of clandestine station QSL's. Veteran *MT* supporter Rob Ross of London, Ontario, sends in his latest example, a full data RMI QSL from *La Voz de la Unidad Cubana*, including the specific Unidad Cubana station name. RMI packages an extensive lineup of clandestine programming relays, mostly from anti-Castro groups, on stations such as WRNO on 7355 and 7395 kHz. They offer a complete program guide for a self-addressed stamped return envelope.

Your reception reports to the clandestines also should include return postage. The Radio Miami International address is PO Box 526852, Miami, FL 33152. We still have no firm startup date for RMI's own Florida transmitter.

Mystery Solved by Bust

Last month we covered a new mystery relay station on the surprising frequency of 6250 kHz. *MT* reader Pat Murphy of Chesapeake, VA, was one of the first to solve the puzzle. Scores of radio monitors heard apparently 24 hour relays of licensed Tidewater commercial broadcasters such as WMXN-FM in Portsmouth, VA. Pat reports that the FCC traced the strange signal to an amateur radio operator in Moyock, NC.

The ham claimed that he was simply relaying the WMXN signal from his house to his adjacent backyard amateur shack. The FCC took a dim view of this, since the signal was getting out many hundreds of miles beyond the ham's back yard. FCC personnel reportedly discovered a number of CB linear amplifiers while closing down this unlicensed 49 meter operation.

Clandestine Potpourri

Scott Edwards of Los Alamitos, CA, forwards a *New York Times* article on continued fighting within Angola between UNITA rebels and the Popular Movement government of that African country. The newspaper quoted UNITA's clandestine *Voz de la Resistencia de Gallo Negro*. This clandestine is frequently heard in North America on 9700 kHz around 0445 UTC. Look for their crowing rooster interval signal.

Both Scott Edwards and Rob Ross report loggings of the anti-South Korean Voice of National Salvation. The station punches through to the Western Hemisphere on parallel frequencies of 3480 and 4450 kHz, usually around local sunrise or sunset. The frequencies are slightly variable in response to constant jamming.

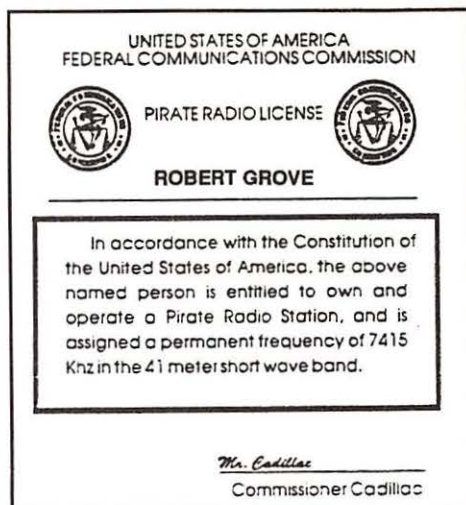
Our Perm, Russia, correspondent Stanislav Mekhonoshin bagged the Cambodian clandestine Voice of the Khmer on 6325 kHz at 2330 UTC. We might have a shot at this one from North America during the spring months at that time, but ship utility traffic QRM could be brutal.

Thanks go to Lloyd Leheny of Springfield, IL, for an *Illinois Times* column about Mbanna Kantakols Black Liberation Radio. Unlike Napoleon Williams' Decatur, IL, station of the same name that we covered last month, Kantakols' long running one watt version remains active on the local FM broadcasting band in Springfield.

Bob Grove Honored (?) Again

As you see on these pages, Commissioner Cadillac of DC Radio has bestowed an official (?) FCC Pirate Radio License upon the President of Grove Enterprises. When asked for comment in Brasstown, Grove indicated that he retains his regular WA4PYQ amateur radio license, and that he has absolutely no future plans for a pirate station on 7415 kHz.

I also received a similar "license," but I



Grove denies plans for Radio Free Brasstown.

hasten to point out that Commissioner Cadillac is pulling our legs; I'm no April Fool!

Recent Pirate QSL's

Scott Krauss of Cleveland, OH, reports QSL's from WVOL, RBCN, and Mystic Voice of the Western Prairies. The overwhelming majority of pirates have a solid track record as excellent verifiers. But, Pat Libretti of New Paltz, NY, writes in with a different tale. Pat mailed gift calendars to more than a dozen pirate stations that he heard early in 1992. More than a year later, he reports that he has received responses from none of them. But, he did find a QSL in his mailbox from WRAR, even though he mailed no calendars or reports to them!

It's hard to tell why Pat might have had this unusual experience. We should remember, however, that reports to pirate radio stations *must* include three units of first class postage to finance the maildrop process, or else replies are unlikely. The reports should include the date, time, and frequency of reception, a discussion of reception quality, a list of programming details that were heard, and identification of the receiver and antenna that were used during the logging. If you omit any of these procedures, your odds of a subsequent reply shrink considerably.

What We Are Hearing

We have another deluge of North American pirate logs. We'd love to see your info here, and you can send it in via Brasstown. Maildrop addresses used by pirate stations listed this month include PO Box 452, Wellsville, NY 14895; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 293, Merlin,

Ontario, Canada, N0P 1W0; PO Box 493, Boys Town, NE 68010; and 770 Sycamore Avenue #J193, Vista, CA 92083. Times are in UTC, with frequencies in kHz.

Action Radio- 7415 at 0000. A. J. Michaels' attacks on Lad of the *Voice of the Night* are now more vicious, with readings of Lad's alleged home address. A cease-fire on both sides of this conflict would be welcome. Addr: Boys Town. (Robert E. Thomas, Bridgeport, CT)

Anarchy One- 7415 at 0430. Skip suggests that Captain Anarchy could use some repairs to his transmitter's modulation quality. Addr: Vista. (Skip Harwood, CA)

CKLW- 7417 at 2100. Host John Lodge replicates the old 1960's motown rock/soul sound of CKLW-800 in Windsor, Ontario, complete with original jingles and actual Detroit commercials. Detroit area *MT* readers will note that **CKLW-FM** on 93.9 MHz has also revived this nostalgia format. Addr: Blue Ridge Summit. (Jim Kalach, Waterbury CT; Max Syko, Vassar, MI)

CSIC- 7413 at 2245. Pirate Rambo is still widely heard from the Great White North with a combination of his own clever productions, "Psycho Chicken" interval signal, and relays of other pirates. Addrs: Blue Ridge Summit for USA listeners; Merlin for Canadians. (Russ Jolly, Rowe, MA; Alan Masyga, Winona, MN; John Hollowell, Port Republic, MD; Greg Martin, MI)

DC Radio- 7416 at 0230. When they're not sending pirate licenses to Bob Grove, about half of their broadcasts are plugs for their "Don't Vote Republican" slogan in CW Morse code. Addr: None, but verifies loggings in the *ACE* bulletin. (Bill Hennessy, Marble Falls, TX)

Hello Radio- 7415 at 0030. We still regularly hear this pirate jammer. Note to the operator: why not consider some program productions, which your listeners would find to be more entertaining? Addr: None. (Hollowell)

He Man Radio- 7415 at 2330. He Man, with his sexist taunts of women, is the opposite of *WYMN* (see below). He especially picks on Kristin Kaye of *WWCR*'s "Signals" DX program. Addr: Blue Ridge Summit. (Martin, Hollowell, Syko, Masyga)

Jolly Roger International- 7415 at 0500. Pirate Blackbeard's very slick productions of rock music, ads for pirate publications, and FCC helicopter reports remain very popular. Unlike nearly all other pirates, he requests \$1 US return postage with reception reports instead of three first class stamps. Addr: Wellsville. (Hennessy)

KMRZ- 6205 at 0130. Dr. Lobotomy has used his traditional *WARI* ID in 1993, but recent shows have announced a call letter change. He still can be found around 7415 kHz, but note the 49 meter frequency here. The *Pirate Pages* newsletter found that he was the most active North American pirate in 1992. Addr: Wellsville. (Hollowell)

KRXX Relay- 7415 at 0015. Many DXers heard the very funny January 3 pirate relay of the "Oh Brothers" show from KRXX-FM, 93.7 MHz in Minneapolis. John Hollowell now reports that he heard an identification of the pirate relay station as *WRFJ*. Addr: None. (Hollowell)

North American Pirate Relay Service- 7416 at 0115. So far this one has mainly been testing with rock music, but they obviously plan to relay other pirates. Rob reports that their North American map QSL card is sharp! Addr: Wellsville. (Ross)

Omega Radio- 7416 at 0030. A 1992 FCC bust has not silenced Dick Tator's religious station. Look for their "Spirit in the Sky" interval signal. Addr: Wellsville. (Hollowell)

Pan Global Wireless- 7416 at 0045. Mike Oxiong's new station got good reviews from pirate listeners. He plugs free radio and individual freedom from an announced location in the northwestern Mexican state of Sonora, complete with the Mexican national anthem at sign-off. Addr: Wellsville. (Hollowell)

Radio Airplane- 7417 at 0115. Pirate Captain Eddy says that he broadcasts live from a Piper Cub airplane in flight, with rock music and commentary about events on the ground below. Addr: Wellsville. (Richard Dale, Independence, MO)

Radio Beaver- 7416 at 2115. It's easy to identify Bucky Beaver's popular station by its interval signal music, which is the theme from the old "Leave It to Beaver" television show. Addr: Merlin. (Jolly, Lakach, Hollowell, Martin, Syko)

Radio Bland- 7414 at 2300. Ralph Jensen and Don Perry have produced another hilarious DX program parody. Much of the show is devoted to Sven Gonzalez' satirical spoof of *MT*'s Glenn Hauser. Addr: Blue Ridge Summit. (Hollowell, Syko, Martin)

Radio Clandestine- 7415 at 2315. R. F. Burns, North America's oldest pirate, is still heard with some regularity. But, it appears that these shows are all taped 1980's programs from an unidentified pirate relay. Addr: Formerly good addresses now defunct. (Thomas, Hollowell, Dale, Martin)

Radio Esoterica- 7415 at 2245. Station announcer Moriarty has created a format that matches the station name, with music from various countries that you won't hear on commercial radio stations. Addr: Stoneham. (Michael McDaniel, Bloomfield, MI; Brent Walker, Marion, NC)

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Radio EXP- 7415 at 2300. Dr. Blue's rock station has been around for eight years now. Addr: Wellsville. (Martin)

Radio Fluffnut- 7411 at 2230. This one has returned to the air. Although its name is creative, it features pretty standard rock music fare. Addr: Merlin. (Martin)

Radio Free East Coast- 7417 at 2100. This new one features rock music. Their announcer claims approval by the FCC and compliance with community standards, but the first claim is doubtful. Addr: Wellsville. (George Zeller, Cleveland, OH)

Radio USA, real and fake- 7413 at 0000. A fake Radio USA unfortunately creates profane mayhem at times. It's easy to tell the real Mr. Blue Sky or Joe King from this imposter, since the regular station features no jerks. Addr: Wellsville for real, None for fake. (Masyga)

Tangerine Radio- 7415 at 2245. "Raunchy Rick" Forester's anarchist station was silent for several years after regular mid-1980's activity. It fortunately has returned with rock, comedy, and novelty tunes like "Mennonite Surf Party." Addr: Wellsville. (Murphy)

Voice of Anarchy- 7415 at 0130. Leonard Longwire usually programs diverse foreign music mixed with pleasant low key commentary. All shows are sponsored by Suckmaster Vacuum Cleaners. Addr: Blue Ridge Summit. (Hennessy, Syko)

Voice of Bono- Here's another one with an unusual interval signal, which is yelping from a small dog. Host Gary Daniels says that he tries to produce shows that are different from fare on other stations. Addr: Wellsville. (Norm Alexander, Diamond Springs, CA; Syko, Dale, Hollowell, Martin, Harwood, Masyga)

WRV- 7415 at 0500. Their slogan is "Radio Virus, the station nobody wants to catch." Pirate Pete plays rock, sometimes identifying the station with his own name. Addr: Wellsville. (Dale, Martin)

WSKY- 7418 at 0500. They continue their slickly produced format of rock oldies, recently with more frequent talks on social issues by Doug Barley and Mike Richards. Jim's first pirate! John Hollowell's log came while he was vacationing on a boat in the British Virgin Islands. Nice DX, John! Addr: Wellsville. (Jim Keeling, Overland Park, KS; Alexander, Hennessy, Hollowell, Harwood, Syko)

WYMN- 7413 at 2300. Pirate Jenny's veteran station, the only all-female North American pirate, still features female folk singers and comedy sketches with sly barbs against sexist men. Addr: Wellsville. (Murphy)

MT

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County Seat & St. Capital: Denver

United States of America: 39°45'N - 105°00'W

Sun/100ct192/0506: 0721/ 29°-209°

1650/151°-331°

LP 221° > SP 41° >

Statute Miles: 4,709

Kilometers: 7,578

Nautical Miles: 4,092

Sun/100ct192/ 0721/ 29°-209°

VL -900

TL 0

Options Places Zoom Draw Map Exit Maps

1. Off On Country Names

2. Off On Country & State Borders

3. Off On Grayline

4. Off On Great Circle

5. Off On Lat/Long Lines

Settings Print Exit Graph

Denver United States of America

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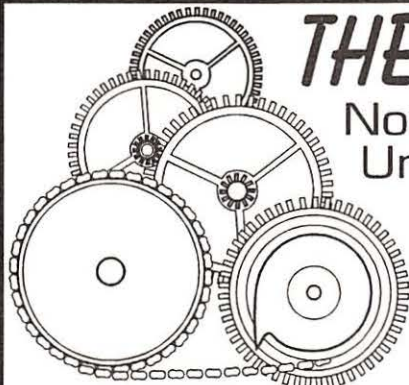
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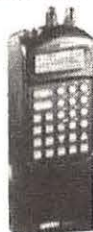
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DISCOVER

Hey, Bow Ties Are In!

In the years since I started writing this column I have made several passing references to a "Bowtie Filter." As a result, I received letters from readers inquiring about the circuit; some readers thought it was a prank or an April Fool's joke! Well, it may be April, but it's no joke. The truth is, I wanted to maintain a proprietary status, even though I do not expect the circuit to become a household item, or an invention that will make me rich!

In fact, the bowtie isn't a filter that the average RTTY enthusiast would give an eye tooth to buy. It wasn't designed to pull those very weak RTTY signals out of the mud!

It is, however, a very good tuning aid which can be used to copy very narrow shifts at high baud rates. It can also be used as a very accurate measuring device for determining shifts. You may have noticed that in some of my loggings I have listed a 265 Hz shift, for example. I was able to measure it within 5 Hz using the Bowtie circuit that I installed in my M8000. (I also use one in my M7000.)

What is a Bowtie Filter?

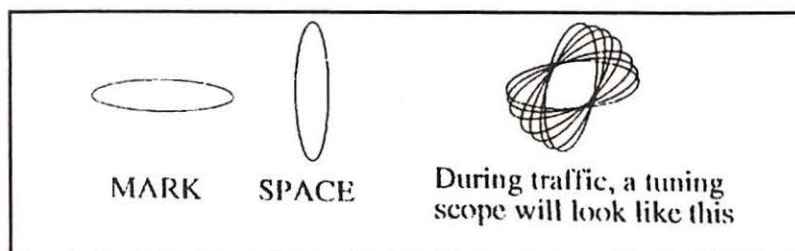
If you use an oscilloscope and you're familiar with the "crossed football" display that is used for tuning a radioteletype signal, you already know that a mark tone is represented by a horizontal ellipse and a space is represented by a vertical ellipse (Figure 1).

The ellipse pattern is okay for simple tuning, but it has drawbacks and limitations. The oscilloscope can reflect problems that are associated with the filter circuitry. For example, the football or ellipse display in Figure 2 indicates that the filters have poor mark/space separation.

Another problem known as "grass" (see figure 3) indicates two things: Either you have poor filter or phase response, or there are multipath problems in the received signal. Additionally, the crossed football is not accurate for FSK frequency measurements because it's distorted by the poor filter performance.

These filters are sometimes referred to as

Fig. 1



A distorted display with filter problems

Fig. 2

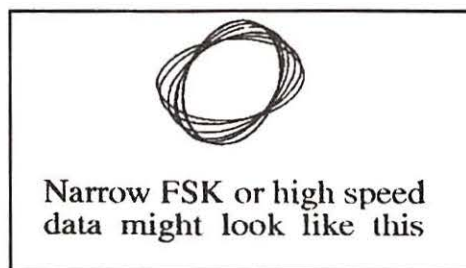


Fig. 3

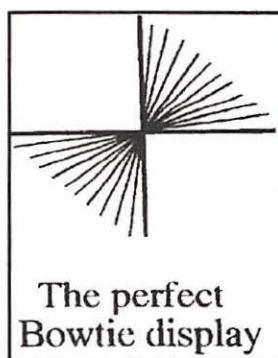


Fig. 4

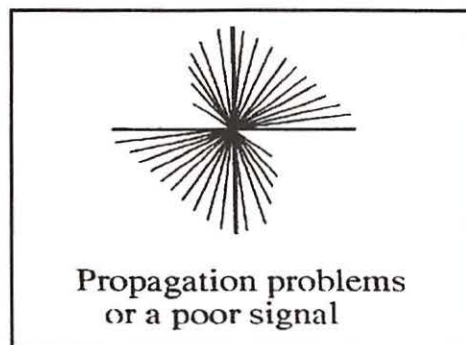


Fig. 5

the discriminator or FSK detector. RTTY uses frequency shift keying (FSK), which is a form of frequency modulation (FM). For more details about modems and how the bowtie improves FSK reception, write to the address below.

Now that packet radio and other high speed data modes are becoming popular on the HF bands, it's time to take a new approach to filter and HF modem design. I discovered the advantages of using the bowtie filter in the early 80's when packet was in its infancy.

The bowtie filter improves FSK tuning by changing the "crossed footballs" into an X or bowtie display. It doesn't require complicated filter circuits and yet it can provide an excellent tuning scope display and you can actually analyze the signal! When reception is perfect you will see a display that looks like the one in figure 4. But when problems occur during reception, the bowtie circuit displays the imperfections (see fig 5).

Another amazing feature is, no matter how narrow the shift is adjusted, the bowtie doesn't change. The same pattern, for example, can be displayed on the "O-scope" using shifts from 425 Hz down to 30 Hz. When narrow shifts are selected on the M7000 and M8000, the filters can correct the dimmed mark/space LED display. Using 30 Hz shift, you can tune to a carrier of an AM shortwave broadcast station and display frequency drift or FM modulation problems in the transmitter. Or you can display strange or esoteric modes like warbly carriers or NSK RTTY. I used the bowtie to measure and analyze the piccolo mode in the early 80's.

With a bowtie filter installed in the M7000 or M8000, there are some quirks. Because Infotech didn't design the units with a bowtie filter in mind, you have to play around with the filter bandwidth control when you select different baud rates and shifts. I simply store the settings in memory and recall them when I change modes.

Filter upgrade boards are available from Willco Electronics (P.O. Box 788, New Lenox, IL 60451) for \$59.95 for the M7000 and \$69.95 for the M8000. To celebrate the introduction of the new products during May and June, Willco is offering (\$10.00) off the list price.

NNN



BOWTIE FILTERS
FOR M8000 AND M7000

Now available from WILLCO Electronics,
P. O. Box 788 New Lenox, IL 60451

COMING SOON! 1000+ (NO FAIL)
Memory replacement boards for
Icom R71, 751, 271 & 471. Also
Hamcom and SuperHamcom decoders

I'd Walk a Mile For...

A QSL? Yes, I bet many of us would, if it meant your most sought after station would reply!

But why not try a new tactic? Have you considered mailing your letter via registered mail? Although this method is more expensive, it could be the answer to your reply rate.

Not only does this call attention to your letter, it may also present an air of importance.

For a few cents more, ask for a return receipt for your registered letter. The receipt is returned to you, and has been signed by the addressee. Now you have positive proof that your letter arrived, and in the case of a follow-up report you can include a xerox copy of the receipt.

If money is not a problem, ask for Restricted Delivery. This will specify that delivery of your letter is restricted to one particular person — for instance, a veri signer. Good luck!

AUSTRALIA

AXM 34 & 35, Bureau of Meteorology 11030 kHz/13920 kHz. Full data QSL card, verified by Philip O'Donnell & Angus Low. Received in 16 & 55 days for a copy of FAX report, 1 IRC and mint stamps. Station address: 150 Lansdale Street, Director of Meteorology, Attention: SRCM, GPO Box 1289 K, Melbourne, Victoria 3001 Australia. (Martin Nagl, Austria DX Club, Neulengbach, Austria)

BELGIUM

Radio Vlaanderen Intl, 9930 kHz. Partial data QSL card, without veri signer. Received in 62 days for an English report. Station address: P.B. 26 B, 1000 Brussels, Belgium. (Doug Merkel, St. Louis, MO)

COSTA RICA

Radio for Peace Intl, 15030 kHz. Full data card, without veri signer. Schedule and station information included. Received in 42 days for an English report. Station address: P.O. Box 88, Santa Ana, Costa Rica. (Richard A. Jones, Dayton, OH)

IRAN

9BC 22-IRNA, 7801 kHz. Full data QSL card, with illegible signature, and transmission schedule. Received in 29 days for a copy of RTTY report, 1 IRC, and mint stamps. Station address: Islamic Republic News Agency, Technical Deputy to Managing Director, 873 Vali asr Avenue, Tehran, Iran. (Nagl, Austria)

MEXICO

Radio Educacion, 6185 kHz. Full data Spanish QSL letter, station brochures and souvenir postcard. Received in 7 months for a Spanish report. Station address: Angel Urraza 622,03100 Mexico. (Stephen J. Price, Conemaugh, PA)

NON DIRECTIONAL BEACONS

HEH-Heath, OH. 524 kHz. Full data prepared QSL returned with illegible signature. Received in 7 days for an English utility report. Station address: Manager FAA/FSS, Newark/Heath Airport, 530 Heath Road, Heath, OH 43056. (Mike Hardester, Jacksonville, NC)

XO-Alexandria, VA. 305 kHz. Confirmation letter, signed by W.H. Southwood. Received in 16 days for an English utility report and mint stamps. Station address: US Dept. of Transportation, Commander Fifth Coast Guard District, 431 Crawford Street, Portsmouth, VA 23704-5004. (Hank Holbrook, Dunkirk, MD) Beacon noted as experimental for use with the new Global Positioning System.(GVH)

CB-Cape Henry Light Station, VA. 289 kHz. Radio beacon Field Intensity Measurement letter with handwritten information on CB beacon, signed by W.E. Roche, USCG (KQ4CA). Received in 37 days for an English utility report and mint stamps. Station address: c/o Commander, USCG Group Hampton Roads, 4000 Coast Guard Blvd., Portsmouth, VA 23703-2199. (Holbrook, MD)

SAUDI ARABIA

BSKSA, 11685 kHz. Full data card without veri signer. Schedule, booklet on Islam, and personal letter sent by registered mail. Received in 54 days for an English report. Station address: Broadcasting Services of Saudi Arabia, P.O. Box 61718, Riyadh, 11575, Saudi Arabia. (Jones, OH)

SHIP TRAFFIC

OMIDYNACHEM-N4DQT, 14313 kHz. (Tanker) Full data prepared QSL card, without veri signer. Received in 34 days for an English utility report and mint stamps. Ship address: c/o George Patterson, 225 Shore Lane, Indian Harbour Beach, FL 32937. (Holbrook, MD)

OMI HUDSON-W1RND, 21402 kHz. (Tanker) Full data QSL card, verified by Raymond Sudcliffe-Radio Officer. Personal letter and photo of vessel included. Received in 69 days for an English utility report and mint stamps. Ship address: 42430 62nd Street W., Quartz, CA 93536-4522. (Holbrook, MD)

DEBA GIULIA-IBFX, 15665 kHz. (Merchant Vessel) Full data prepared QSL card, verified. Received in 99 days for an English utility report and one U.S. dollar. Ship address: Compagnia General Telemar, Viale Tiziano 19, 00196 Rome, Italy. (Holbrook, MD)

SOUTH KOREA

Radio Korea, 15575 kHz. Full data card without veri signer. Three schedules, and station stickers. Received in 19 days for an English report. Station address: Overseas Service, Korean Broadcasting Service, 19 yoido-dong Youngdunp-KU, Seoul, 150-790 Rep. of Korea. (Jones, OH)

SWITZERLAND

Swiss Radio Intl, 17730 kHz. Full data QSL card, verified by Gillian Zbinden. Schedules and questionnaire

included. Received in 41 days for an English report, 2 IRCs, and souvenir postcard. Station address: P.O. Box CH-3000 Berne 15, Switzerland. (Ernest T. Bagley Sr., South Portland, ME)

TURKEY

Voice of Turkey, 9445 kHz. Full data card without veri signer. Schedule, maps and souvenir postcard. Received in 26 days for an English report. Station address: P.K. 333, 06443, Yenisehir Ankara, Turkey. (Jones, OH)

UNITED STATES

KPH-San Francisco Radio. Full data letter, signed by Mike Walsh. Received in 10 days for an English utility report, mint stamps, and an address label (used). Station address: MCI International, Inc., 17400 Sir Francis Drake Blvd., Point Reyes, CA 94956. Hardester, NC)

WOGL-AM 1210 kHz//Parallel station 98.1 MHz. Full data letter signed by Sam A. Virgillo-Tech. Supervisor. Souvenir black-and-white postcard depicting old WCAU first 50Kw AM transmitter (circa 1930). Received in 29 days for an English AM report and mint stamps. Station address: City Line & Monument Road, Philadelphia, PA 19131. (Michael J. Mc Ferrin, Brights Grove, Ontario, Canada)

WGTY-FM 107.7 MHz. Full data QSL letter verified by Rod Burnham-Vice President & General Manager. Received in 10 days for an English FM report and mint stamps. Station address: P.O. Box 3179, Gettysburg, PA 17325-0179. (Holbrook, MD)

WXNJ-FM 94.3 MHz. Full data QSL letter verified by Sid Friedman-President. Received in 10 days for an English FM report and mint stamps. Station address: P.O. Box 94, Avalon, NJ 08202. (Holbrook, MD) Veri signer noted, "I am thrilled to know that you are monitoring FM stations, your dedication to radio is truly an inspiration to all broadcasters."

WCC-Chatham Radio, 8630 kHz. Full data letter, verified by W.H. Farris Jr.-Manager. Received in 29 days for a copy of CW report, souvenir postcard, 1 IRC which was returned, and mint stamps. Station address: MCI International Inc., Chatham Radio WCC, P.O. Box 397, North Chatham, MA 02650-0397. (Nagl, Austria)

RADIO FOR PEACE INTERNATIONAL



"5 Years of Serving Shortwave Listeners 1987-1992"

Our own Rachel Baughn received this Radio for Peace International 5th anniversary QSL last fall.

How to Use the Shortwave Guide**1: Convert your time to UTC.**

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Daylight Saving Time) 4, 5, 6, or 7 hours for Eastern, Central, Mountain, or Pacific Time, respectively.

Note that all dates, as well as times, are in UTC: for example, the BBC's "Ken Bruce Show" (0030 UTC Sunday) will be heard on Saturday evening (8:30 PM Eastern, 5:30 PM Pacific) in North America, not on Sunday.

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours. If it's news you're interested in, check out the complete "Newline" listing, which begins on the next page.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a re-run, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday W: Wednesday A: Saturday
M: Monday H: Thursday
T: Tuesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location, and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am: The Americas	me: Middle East
na: North America	as: Asia
ca: Central America	au: Australia
sa: South America	pa: Pacific
eu: Europe	va: various
af: Africa	do: domestic broadcast
me: Middle East	om: omnidirectional

Consult the propagation charts. To further help you find the right frequency, we've included propagation charts at the back of this section, which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News and Hot Spots**Czech It Out**

With the recent breakup of Czechoslovakia into two separate republics, Radio Czechoslovakia has claimed the name Radio Prague. English to North America has been monitored using the same times and frequencies and IDing as "Radio Prague, the External Service of Czech Radio."

While the studios are located in Prague, transmitters are in both the Czech Republic and in Slovakia. So far no English programming has been noted from Bratislava, the Slovakian capital.

Iraqi News in English

Radio Iraq International was monitored in late February with news in English for North America on 11860 between 0400 and 0415 UTC. Sign on time for this service is at 0215. Tune in early for some great examples of Arabian music, and listen closely for the station ID in Arabic, Huna Baghdad.

Frequency Shifts

Radio Vilnius has closed its Far-East relays to North America on 17690 and 17605. These



two frequencies put out some of the strongest signals heard on the West Coast during 0000 to 0030 transmission, and will be sorely missed.

On a brighter note, Radio Netherlands is continuing tests in English on its Far-East relay to Asia on 12025 between 0130 and 0330. Correct reception reports for this transmission will be verified with a special QSL card.

Top 40 on Shortwave

Daniel Coffey, stationed on a ship off the coast of Somalia, reports his appreciation for VOA's transmission of Casey Casem's "American Top 40" show. Before Daylight Savings

Time, it was airing at 0900 UTC on 17710 kHz on VOA's broadcasts to Europe. Daniel encloses the ship's MARS station QSL card.

Squaring Off

Under President Clinton's budget-cutting plan, Radio Free Europe and Radio Liberty may be shut down, and there is a proposal to consolidate the other overseas broadcasting agencies under the United States Information Service. While the players take their positions for the fight, a new contender has entered the scene. The Corporation for Public Broadcasting has expressed an interest in administering government-supported domestic and international broadcasting—as has the Board for International Broadcasting, which might otherwise be dismantled.

Contributor Chet Copeland of Washington, D.C. commented that, "National Public Radio turned down the idea of 'C-Span' so the cable industry picked it up; I'm sure they want to avoid another misstep."

Thanks for this month's Hot News go to David Datko, Daniel Coffey, Chet Copeland and David D'Ermilio, and Dave Alpert.

MT Monitoring Team

P.O. Box 98, Brasstown, NC 28902-0098

Greg Jordan
Frequency Manager
North Carolina

Jacques d'Avignon
Propagation Forecasts
Ontario, Canada

Kannon Shanmugam
Program Manager
Kansas

Dave Datko **B.W. Battin**
California New Mexico

John Carson
Oklahoma

Gayle Van Horn
Louisiana

May Deadline:
March 25

Jim Frimmel
Texas

newsline

"Newsline" is your guide to news broadcasts on the air. • All broadcasts are world news reports unless followed by an asterisk, which means the broadcast is primarily national news. • All broadcasts are daily unless otherwise noted by the day codes.

0000 UTC (8:00 PM EDT, 5:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec China Radio Int'l Christian Science Monitor Croatian Radio, Zagreb [M-A] Radio Australia Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l Radio Prague Radio Sofia Radio Thailand Radio Ukraine Int'l SBC Radio 1, Singapore Spanish National Radio Swiss Radio Int'l Voice of America WWCR [T-A] 0005 Radio Pyongyang 0010 China Radio Int'l* 0030 All India Radio C Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines HCJB Radio Havana Cuba [T-S] Radio Korea Radio Moscow Radio Netherlands Radio New Zealand Int'l [M-F] Radio Yugoslavia Voice of America (am,as) (Special English) [T-S] V of America (as) (Spec Eng) [M] 0035 All India Radio (News Service) 0045 Radio Korea (News Service) 0055 WRNO [W, A] 0100 UTC (9:00 PM EDT, 6:00 PM PDT) BBC CBC, Northern Quebec [S-M] Christian Science Monitor Croatian Radio, Zagreb [S] Deutsche Welle FEBC Radio Int'l, Philippines Radio Australia	Radio Canada Int'l [S-M] Radio Havana Cuba [T-S] Radio Japan Radio Moscow Radio New Zealand Int'l [M-A] Radio Prague Radio Romania Int'l Radio Tashkent Radio Thailand Radiotelevisione Italiana SBC Radio 1, Singapore Spanish National Radio Voice of America Voice of Indonesia WWCR [T-A] 0115 Radio Havana Cuba* [T-S] 0125 Radio Korea [T-A] 0130 C Science Monitor (as) [M] Christian Science Monitor [T-F] FEBC Radio Int'l, Philippines Radio Austria Int'l Radio Bangladesh Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Tirana Radio Yugoslavia Voice of Greece 0145 Radio Finland [T-S] 0155 Voice of Indonesia 0200 UTC (10:00 PM EDT, 7:00 PM PDT) BBC ("Newsdesk") CBC, Northern Quebec [T-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle Radio Australia Radio Budapest Radio Canada Int'l [T-A] Radio Havana Cuba [T-S] Radio Moscow Radio New Zealand Int'l [M-A] Radio Thailand RAE, Buenos Aires [T-A] SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Free China	Voice of Myanmar WWCR [T-A] 0215 Radio Cairo Radio Nepal 0230 C Science Monitor (af,me) [M] Christian Science Monitor [T-F] HCJB Radio Havana Cuba [T-S] Radio Moscow Radio Netherlands Radio Pakistan (Special English) Radio Portugal [T-A] Radio Tirana SLBC, Sri Lanka 0245 All India Radio (News Service) 0250 Radio Yerevan 0300 UTC (11:00 PM EDT, 8:00 PM PDT) BBC CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle Kol Israel Radio Australia Radio Bahrain Radio Canada Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Prague Radio Tanzania Radio Thailand SBC Radio 1, Singapore Swiss Radio Int'l Voice of America Voice of Turkey ZNBC Radio 2, Lusaka 0402 Radio Botswana 0405 Radio Pyongyang 0410 China Radio Int'l* 0425 Radiotelevisione Italiana 0430 C Science Monitor (af,as) [M] Christian Science Monitor [T-F] Radio Bahrain Radio Finland [M-A] Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l 0445 BBC (af)* [M-F] 0450 Channel Africa, Johannesburg	0500 UTC (1:00 AM EDT, 10:00 PM PDT) BBC ("Newshour") CBC, Northern Quebec Channel Africa, Johannesburg China Radio Int'l Christian Science Monitor Deutsche Welle HCJB Radio Australia Radio Bahrain Radio Havana Cuba [T-S] Radio Japan Radio Lesotho Radio Moscow Radio Thailand SBC Radio 1, Singapore Spanish National Radio Voice of America WWCR [M] ZNBC Radio, Lusaka 0510 China Radio Int'l* Radio Botswana [M-A] 0515 Radio Canada Int'l [M-F] Radio Havana Cuba* [T-S] 0520 Radio For Peace Int'l [T-A] 0530 C Science Monitor (af,as) [M] Christian Science Monitor [T-F] Radio Austria Int'l Radio Havana Cuba [T-S] Radio Moscow Radio Romania Int'l Radio Thailand RTM, Malaysia UAE Radio, Dubai Voice of Nigeria 0545 Radio Romania Int'l Voice of Nigeria* 0600 UTC (2:00 AM EDT, 11:00 PM PDT) BBC BBC (af)* [A-S] Channel Africa, Johannesburg Christian Science Monitor Deutsche Welle GBC Radio, Accra* Radio Australia Radio Bahrain Radio Havana Cuba [T-S]
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Radio Korea
Radio Moscow
Radio New Zealand Int'l
Radio Prague
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
Voice of Malaysia
ZNBC Radio, Lusaka [M-A]
0603
Croatian Radio, Zagreb [M-A]
0605
Radio Pyongyang
0609
BBC*
0630
BBC (af)* [M-F]
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Havana Cuba [T-S]
Radio Moscow
Radio Vlaanderen Int'l
RTV Congolaise, Brazzaville [M-F]
Voice of Nigeria
0645
Radio Finland [M-A]
Voice of Nigeria*
0655
Radio Korea [M-F]

0700 UTC (3:00 AM EDT, 12:00 AM PDT)

BBC ("Newsdesk")
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-A]
Radio Australia
Radio Bangladesh
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [M-F]
SBC Radio 1, Singapore
SLBS, Freetown
Voice of Free China
Voice of Myanmar
0703
Croatian Radio, Zagreb [S]
0705
Radio Pyongyang
0730
All India Radio (News Service)
BBC (af)* [A]
Christian Science Monitor [M-F]
HCJB
Radio Ghana
Radio Moscow
Radio Netherlands
Radio Prague
0750
Radio For Peace Int'l [T-A]
Radio New Zealand Int'l* [M-F]
Radio Pacific Ocean [A]
0755
Radio Japan [M-F]

0800 UTC (4:00 AM EDT, 1:00 AM PDT)

BBC
Christian Science Monitor
GBC Radio 1, Accra [S]
GBC Radio 2, Accra
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Pakistan

SBC Radio 1, Singapore
SLBS, Freetown
Voice of Indonesia
Voice of Malaysia
ZNBC Radio 2, Lusaka [M-A]
0802
Radio Botswana
0803
Croatian Radio, Zagreb [M-A]
0805
Radio Pyongyang
0830
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l
Radio Moscow
Radio Netherlands
0840
Voice of Greece [M-A]
0850
All India Radio (News Service)
(Special English)
0855
Radio Korea [M-F]
Voice of Indonesia

0900 UTC (5:00 AM EDT, 2:00 AM PDT)

BBC
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 1, Accra [M-F]
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre M-A]
Radio Australia
Radio Bahrain
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of Nigeria
0910
China Radio Int'l*
0915
Radio Korea (News Service)
0930
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle (af)* [M-F]
FEBC Radio Int'l, Philippines
Radio Afghanistan
Radio Moscow
Radio Netherlands
0940
Radio Togo
0955
Radio Japan [M-F]

1000 UTC (6:00 AM EDT, 3:00 AM PDT)

All India Radio
BBC
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra [A]
HCJB
Kol Israel
MBC, Blantyre [S]
Radio Australia
Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S]
Radio Tanzania
SBC Radio 1, Singapore
Voice of America

WWCR [M-F]
WYFR (Network) [M-F]
ZNBC Radio 2, Lusaka [M-A]
1010
China Radio Int'l*
1030
Christian Science Monitor [M-F]
MBC, Blantyre [M-F]
Radio Austria Int'l [M-F]
Radio Korea
Radio Moscow
Radio Prague
Radio Sofia
RTM, Malaysia
UAE Radio, Dubai
Voice of Nigeria
1040
Voice of Greece [M-A]
1055
All India Radio

1100 UTC (7:00 AM EDT, 4:00 AM PDT)

BBC ("Newsdesk")
CBC, Northern Quebec [A-S]
Channel Africa, Johannesburg
Christian Science Monitor
Deutsche Welle
GBC Radio, Accra [A-S]
MBC, Blantyre [A-S]
Radio Australia
Radio Bahrain
Radio Japan
Radio Jordan
Radio Korea
Radio Moscow
Radio New Zealand Int'l [M-F]
Radio Pakistan
SBC Radio 1, Singapore
Swiss Radio Int'l
TWR, Bonaire [M-F]
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1105
Radio Pakistan (Special English)
Radio Pyongyang
1110
Radio Botswana [M-F]
1115
Radio Korea (News Service)
Radio Nepal
1125
Radio Botswana [A-S]
Radio New Zealand Int'l* [M-F]
WYFR (Network) [M-F]
1130
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Radio Finland [M-F]
Radio Lesotho
Radio Moscow
Radio Netherlands
Radio Thailand
Radio Vlaanderen Int'l [S]
Radio Yugoslavia
RTM, Malaysia*
1135
All India Radio (News Service)
1150
Channel Africa, Johannesburg
1155
Radio Japan [M-F]
Radio Korea [M-F]

1300 UTC (9:00 AM EDT, 6:00 AM PDT)

BBC ("Newshour")
CBC, Northern Quebec
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
Kol Israel [S-H]
Radio Australia
Radio Bahrain
Radio Canada Int'l (na) [S]
Radio Iraq Int'l
Radio Jordan
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Tanzania [A-S]
Radio Vlaanderen Int'l [M-A]
SBC Radio 1, Singapore
Swiss Radio Int'l
Voice of America
WYFR (Network) [M-F]
1305
Radio Pyongyang
1310
China Radio Int'l*
Radio Korea [M-F]
1320
Radio For Peace Int'l [T-A]
SLBC, Sri Lanka
1325
HCJB [M-F]
1328
Radio Cairo

1200 UTC (8:00 AM EDT, 5:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor

LBS, Monrovia
MBC, Blantyre [M-F]
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l [M-F]
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [M-F]
Radio Romania Int'l
Radio Tashkent
Radio Thailand
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
TWR, Bonaire [A-S]
Voice of America
WYFR (Network) [M-F]
1203
Croatian Radio, Zagreb
1210
China Radio Int'l*
1215
HCJB [M-F]
Radio Korea
1230
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Cairo
Radio Finland [M-F]
Radio France Int'l
Radio Japan
Radio Moscow
Radio Netherlands
SLBC, Sri Lanka
WYFR (Network) [M-F]
1235
Voice of Greece
1245
SLBC, Sri Lanka
1255
Radio Bangladesh
1257
HCJB [M-F]
1258
Africa Number One, Libreville

1400 UTC (10:00 AM EDT, 7:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
LBS, Monrovia
MBC, Blantyre [M-F]
Radio Australia
Radio Bahrain
Radio Canada Int'l (na) [S]
Radio France Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
RTM, Malaysia*
SBC Radio 1, Singapore
Voice of America
WWCR [M-F]
ZNBC Radio 2, Lusaka [M-F]
1402
Radio Finland [M-A]
1410
China Radio Int'l*
1415
LBS, Monrovia (Special English)
Radio Canada Int'l (eu)
Radio Korea (News Service)
Radio Nepal
1425
HCJB [M-F]
LBS, Monrovia
1430
All India Radio (News Service)
Christian Science Monitor [M-F]
FEBC Radio Int'l, Philippines
Radio Moscow
Radio Netherlands
WYFR (Network) [M-F]
1440
FEBC Radio Int'l, Philippines*
[M-F]
1445
BBC (as) (Special English) [M-F]
Voice of Myanmar
1455
All India Radio
Radio Korea [M-F]

1500 UTC (11:00 AM EDT, 8:00 AM PDT)

BBC
CBC, Northern Quebec [A-S]
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Canada Int'l [S]

Tone/Code Finder

Model TCF-3

Now make your R7000 even more versatile by adding the popular Tone/Code Finder produced by AIE Corp.



\$299.95

Not including memory and RTC

The Tone/Code Finder is composed of a high speed display unit coupled to your receiver. **IT'S PURPOSE IS TO INSTANTLY FIND AND DISPLAY ALL CTCSS AND DIGITAL CODES, INCLUDING SPLIT CHANNEL AND INVERTING CODES.**

On board memory retains all hit and time information which is then transferred to a printer or computer via a RS 232 port upon command. Time is stored in seconds and hits in units. In the event of power loss, the **FINDER** will maintain memory for up to three weeks. (Memory and real time clock optional)

Signal processing is accomplished by an eight pole filter configured as a low pass with a cutoff of 234Hz. The superior filter characteristics eliminates chopping and false reading.

FOR MORE INFORMATION CONTACT:



MEASUREMENTS DIVISION
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*Lawrence Magne
Monitoring Times*

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Radio Japan
Radio Jordan
Radio Moscow
Radio Omdurman, Sudan
Radio Portugal [M-F]
RTM, Malaysia
SBC Radio 1, Singapore
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
Voice of Ethiopia
WWCR [S]
WYFR (Network) [A]
1505
Radio Pyongyang
1510
China Radio Int'l*
1520
Radio Tallinn [M-F]
Voice of Greece
1525
Radio Veritas Asia [T-F]
1530
All India Radio (News Service)
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
FEBA, Seychelles
FEBC Radio Int'l, Philippines
Radio Austria Int'l
Radio Bangladesh
Radio Moscow
Radio Netherlands
Radio Tirana
Voice of Ethiopia
Voice of Nigeria
1540
Radio Veritas Asia [A-M]
Voice of Nigeria*
1545
Radio Korea (News Service)
1550
Radio For Peace Int'l [T-A]
1555
Radio Veritas Asia [A-M]

1600 UTC
(12:00 PM EDT, 9:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
Deutsche Welle
GBC Radio 2, Accra
LBS, Monrovia
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio France Int'l
Radio Jordan
Radio Korea
Radio Lesotho
Radio Liberia
Radio Moscow
Radio Pakistan
Radio Tanzania
SBC Radio 1, Singapore
Voice of America
Yemen Radio
ZNBC Radio 2, Lusaka [M-A]
1609
BBC*
1610
China Radio Int'l*
Radio Botswana [M-F]
1615
Radio Pakistan (Special English)
1630
Christian Science Monitor [M-F]
HCJB [M-F]

Radio Austria Int'l [M-F]
Radio Canada Int'l (as)
Radio Moscow
Radio Romania Int'l
UAE Radio, Dubai
V of America (eu) (Spec Eng)
1655
Radio Korea [M-F]
1700 UTC
(1:00 PM EDT, 10:00 AM PDT)
BBC
CBC, Northern Quebec [A]
Channel Africa, Johannesburg
China Radio Int'l
Christian Science Monitor
GBC Radio 2, Accra
Kol Israel
Polish Radio, Warsaw
Radio Australia
Radio Bahrain
Radio Japan
Radio Moscow
Radio Pakistan
Radio Prague
SLBC, Sri Lanka
Swiss Radio Int'l
Voice of America
WWCR [M-F]
1705
Radio Bangladesh
Radio Pyongyang
1710
China Radio Int'l*
1715
Radio Korea (News Service)
1725
Radio Surinam Int'l [M-F]
1730
All India Radio (News Service)
Christian Science Monitor [M-F]
Radio Moscow
Radio Netherlands
Radio Sofia
1740
BBC (af)*
1750
Channel Africa, Johannesburg
1800 UTC
(2:00 PM EDT, 11:00 AM PDT)
All India Radio
BBC ("Newsdesk")
CBC, Northern Quebec [M-H]
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Afghanistan
Radio Australia
Radio Bahrain
Radio Canada Int'l
Radio Moscow
Radio Nacional do Brasil [M-A]
Radio New Zealand Int'l [S-F]
Radio Omdurman, Sudan
Radio Portugal [M-F]
Radio Romania Int'l
Radio Tanzania
Radio Vlaanderen Int'l
Voice of America
WWCR [M-F]
ZNBC Radio, Lusaka
1815
ZNBC Radio 2, Lusaka*
1825
Radio New Zealand Int'l* [M-F]
1830
BSKSA, Riyadh
Christian Science Monitor [M-F]
Polish Radio, Warsaw

Radio Finland [S-F]
Radio Kuwait
Radio Mogadishu
Radio Moscow
Radio Netherlands
Radio Prague
Radio Yugoslavia
Voice of America (Spec Eng)
1840
Voice of Greece
1845
BSKSA, Riyadh*
Radio Cote d'Ivoire
Radio Guinea, Conakry
1855
Radio Omdurman, Sudan
1857
BBC (af)* [M-F]
1900 UTC
(3:00 PM EDT, 12:00 PM PDT)
All India Radio
BBC
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
HCJB
Kol Israel
KVOH
Radio Australia
Radio Canada Int'l
Radio Japan
Radio Korea
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Portugal [M-F]
Radio Vilnius
RAE, Buenos Aires [M-F]
SLBS, Freetown
Spanish National Radio
Voice of America
1903
Croatian Radio, Zagreb [S]
Voice of Greece
1905
Radio New Zealand Int'l* [S-F]
1910
China Radio Int'l*
Radio Botswana
1930
BBC (af)* [S, F]
Christian Science Monitor [M-F]
Deutsche Welle* [M-F]
Polish Radio, Warsaw
Radio Austria Int'l
Radio Ghana
Radio Moscow
Radio Netherlands
Voice of Nigeria
1935
Radio New Zealand Int'l* [F]
Radiotelevisione Italiana
1945
Radio Sofia
Radio Togo
1955
Radio Korea [M-F]
Radio New Zealand Int'l* [S-H]
2000 UTC
(4:00 PM EDT, 1:00 PM PDT)
BBC
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor
GBC Radio, Accra
KVOH
MBC, Blantyre
Radio Australia

Radio Bahrain
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague
Radio Romania Int'l
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Indonesia
Voice of Nigeria
ZNBC Radio 2, Lusaka
2002
Radio Botswana
2005
Radio Pyongyang
2010
China Radio Int'l*
2025
Radiotelevisione Italiana
2030
Christian Science Monitor [M-F]
Radio Moscow
Radio Nacional de Angola
2045
BSKSA, Riyadh
Radio Korea (News Service)
2055
Voice of Indonesia
2100 UTC
(5:00 PM EDT, 2:00 PM PDT)
All India Radio
BBC ("Newshour")
CBC, Northern Quebec [S-F]
China Radio Int'l
Christian Science Monitor [M-A]
Deutsche Welle
GBC Radio 2, Accra*
KVOH
MBC, Blantyre
Radio Australia
Radio Bahrain
Radio Budapest
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Iraq Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [S-F]
Radio Prague
Radio Ukraine Int'l
Radio Vlaanderen Int'l
Radio Yugoslavia
SLBS, Freetown
Spanish National Radio
Voice of America
Voice of Turkey
ZNBC Radio 2, Lusaka
2103
Croatian Radio, Zagreb
2110
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2115
Radio Finland [S-F]
2120
Radio For Peace Int'l [M-F]
2125
Radio Havana Cuba* [M-A]
2130
Christian Science Monitor [M-F]
Kol Israel
Radio Cairo
Radio Havana Cuba [M-A]
Radio Moscow
Radio Vilnius
2145
Radio Korea
Radio Sofia
Radio Yerevan

2200 UTC
(6:00 PM EDT, 3:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [M-F]
China Radio Int'l
Christian Science Monitor
CIOX, Montreal [M-F]
GBC Radio 2, Accra
MBC, Blantyre
Radio Australia
Radio Canada Int'l
Radio Havana Cuba [M-A]
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Tirana
Radiotelevisione Italiana
SBC Radio 1, Singapore
SLBS, Freetown
Swiss Radio Int'l
Voice of America
Voice of Free China
2209
BBC*
2210
China Radio Int'l*
Radio New Zealand Int'l* [S-H]
2225
Radio Havana Cuba* [M-A]
2230
Christian Science Monitor [M-F]
Radio Havana Cuba [M-A]
Radio Moscow
Voice of America (Special English)
2240
Radio Korea [M-F]
Voice of Greece
2245
GBC Radio, Accra
Radio Yerevan
2300 UTC
(7:00 PM EDT, 4:00 PM PDT)
All India Radio
BBC
CBC, Northern Quebec [A]
Christian Science Monitor [M-A]
Radio Australia
Radio Canada Int'l
Radio Japan
Radio Liberia
Radio Moscow
Radio New Zealand Int'l [A-H]
Radio Vilnius
RTM, Malaysia
SBC Radio 1, Singapore
Voice of America
Voice of Turkey
WYFR (Network) [M-F]
2305
Radio Pyongyang
2330
Christian Science Monitor [M-F]
Radio Austria Int'l [M-F]
Radio Moscow
Radio Nacional, Bogota [A]
Radio Netherlands
Radio Vlaanderen Int'l
RTM, Malaysia*
2335
Voice of Greece
2345
SLBC, Sri Lanka [M]
2350
Radio For Peace Int'l [M-F]
2355
Radio Japan [M-F]
WRNO [W, F]

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BBC WORLD SERVICE

0000 UTC

[8:00 PM EDT/5:00 PM PDT]

FREQUENCIES

0000-0100	Australia, ABC Brisbane	4920do	9660do		
0000-0100	Australia, ABC Perth	9610do			
0000-0030	Australia, Radio	13605pa	15320va	15365pa	17630pa
		17715au	17750as		
0000-0100	Bulgaria, Radio Sofia	7225na	9700na	11720na	
0000-0100	Canada, CBC Northern Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, RCI Montreal	5960na	9755na		
0000-0100	China, China Radio Intl	9770na	11715na		
0000-0100	Costa Rica, AWR Alajuela	9725ca	11870ca		
0000-0100	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na	15030na
0000-0030 a	Croatian Radio via WHRI	7315na			
0000-0100	Cuba, Radio Havana Cuba	6010na	9815na		
0000-0027	Czech Republic, R Prague	7345na	9580na	11990na	
0000-0045	India, All India Radio	9910as	11715as	11745as	15110as
0000-0030	Lithuania, Radio Vilnius	7150am			
0000-0025	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	17770pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0030 sm	Norway, Radio Norway Intl	9645am			
0000-0100	Palau, KHBN	9830va			
0000-0100	Philippines, FEBC Manila	15425as	15455va	17570as	
0000-0100	Russia, Radio Moscow	6000na	7115na	7150na	7170va
		7220va	7295va	9685va	9725va
		9750va	9870na	9890va	12050na
		15425na	15455va	17570as	17655as
		17890va	21480na	21690as	
0000-0100	S Africa, Radio Orion	4810do			
0000-0100	Singapore, SBC1	5010do	5052do	11940do	
0000-0100	Spain, Spanish Natl Radio	9530na			
0000-0030	Switzerland, Swiss R Intl	6135na	9650na	9885na	12035na
		17730na			
0000-0100	Thailand, Radio	9655as	11905as		
0000-0030	United Kingdom, BBC London	5975na	6005af	6175na	6195as
		7180as	7325na	7415as	9580as
		9590na	9915na	11750sa	11945as
		11955as	12095na	15070na	15260sa
		15280va	15360pa	17830as	
0000-0100	USA, CSMonitor Boston MA	5850na	9850af	13760sa	17555as
0000-0100 sa	USA, CSMonitor Boston MA	17865as			
0000-0100	USA, KCBI Dallas TX	15725va			
0000-0100	USA, KTVN Salt Lk City UT	7510am			
0000-0100	USA, KVOH Los Angeles CA	17775am			
0000-0100	USA, VOA Washington DC	5995am	6130as	7120as	7405am
		9455am	9770as	9775am	11580am
		11695am	11760as	15120am	15185as
		15205am	15290as	17735as	17820as
0000-0100	USA, WHRI Noblesville IN	7315na			
0000-0100	USA, WINB Red Lion PA	15145eu			
0000-0100	USA, WJCR Upton KY	7490na	13595na		
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100	USA, WWCN Nashville TN	7435na	13845na		
0000-0100	USA, WYFR Okeechobee FL	5985am	6085na		
0010-0015	Kyrgyzia, Bishkek	4010as			
0030-0100	Australia, Radio	11720pa	11880pa	13605pa	15240pa
		15320pa	15365pa	17715pa	17750pa
		17795pa	17880pa	21740pa	
0030-0100	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0030-0100	Iran, VOIRI Tehran	9022am	11790am	15260am	
0030-0100	Netherlands, Radio	6020na	6165na	7305as	9860as
		11655as	11835na		
0030-0100	South Korea, Radio Korea	15575am			
0030-0100	Sri Lanka, SLBC Colombo	6005as	9720as	15425as	
0030-0100	United Kingdom, BBC London	5965as	5975na	6005sa	6175na
		7135as	7325na	9580as	9590na
		9915na	11750sa	12095na	15260sa
		15280va	15360pa	17830va	
0035-0040	India, All India Radio	4860do	5120as	11920as	

SELECTED PROGRAMS

Sundays

- 0005 Swiss Radio Int'l: Grapevine. Listener letters and comment.
 0018 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. Bob Thomann and Bob Zanotti present shortwave radio news and advice.
 0030 BBC: The Ken Bruce Show. Ken Bruce plays the latest releases, from pop to jazz to country.
 0045 Radio Korea: News Commentary. Opinion on developments in Korea and worldwide.
 0050 Radio Korea: Sites And Sounds. A look at Korea's tourist attractions and industry.

Mondays

- 0005 Swiss Radio Int'l: Feature. See S 0605.
 0030 BBC: In Praise Of God. This month's religious services: "The Pains Of Glass" (5th); "First Encounters With The Risen Christ" (12th); a service from Scotland (19th); "God Alone" (26th).
 0045 Radio Korea: Echoes Of Korean Music. See S 0615.

Tuesdays

- 0005 Swiss Radio Int'l: Dateline. See M 0605.
 0030 BBC: Panel Game. This month, Nigel Rees hosts a quiz on quotations in "Quote, Unquote."
 0045 Radio Korea: News Commentary. See S 0045.
 0050 Radio Korea: Seoul Calling. See M 0620.

Wednesdays

- 0005 Swiss Radio Int'l: Dateline. See M 0605.



Linden Clark, Morning Host on
Radio New Zealand International.

- 0030 BBC: Omnibus. Topical features on almost any topic, from Dracula to drugs. This month: "The Letters Of Charles Dickens" (7th); "Namibian Pictures" (28th).
 0045 Radio Korea: News Commentary. See S 0045.
 0050 Radio Korea: Seoul Calling. See M 0620.

Thursdays

- 0005 Swiss Radio Int'l: Dateline. See M 0605.
 0030 BBC: Comedy/Quiz (except 29th: Two Cheers For April). See W 1530.
 0045 Radio Korea: News Commentary. See S 0045.
 0050 Radio Korea: Seoul Calling. See M 0620.

Fridays

- 0005 Swiss Radio Int'l: Dateline. See M 0605.
 0030 BBC: Music Feature. This month, Geoffrey Norris follows "In The Steps Of Rachmaninoff."
 0045 Radio Korea: News Commentary. See S 0045.
 0050 Radio Korea: Seoul Calling. See M 0620.

Saturdays

- 0005 Swiss Radio Int'l: Dateline. See M 0605.
 0030 BBC: From The Weeklies. Extracts from the best of the week's newspapers and magazines.
 0045 BBC: Recording Of The Week. See M 0615.
 0045 Radio Korea: News Commentary. See S 0045.
 0050 Radio Korea: Let's Sing Together. See F 0620.

0100 UTC

[9:00 PM EDT/6:00 PM PDT]

FREQUENCIES

0100-0200 twhf	Argentina, RAE Buenos Aires	11710am				0100-0200	Singapore, SBC1	5010do	5052do	11940do
0100-0200	Australia, ABC Brisbane	4920do	9660do			0100-0130	South Korea, Radio Korea	15575am		
0100-0200	Australia, ABC Perth	9610do				0100-0200	Spain, Spanish Natl Radio	9530na		
0100-0200	Australia, Radio	193pa	11720pa	11880pa	15240va	0100-0200	Sri Lanka, SLBC Colombo	6005as	9720as	15425as
		15320pa	15365as	17670as	17715pa	0100-0130	Sweden, Radio	9695as	11820as	
		17750as	17880as	21525as	21590as	0100-0200	Thailand, Radio	9655as	11905as	
		21740pa				0100-0200	Ukraine, R Ukraine Intl	6080eu	7180eu	7195eu
								9640eu	9710eu	9860eu
								17605na	17690na	
0100-0200	Canada, CFCX Montreal	6005do				0100-0130	United Kingdom, BBC London	5965as	5975na	6005sa
0100-0200	Canada, CFRX Toronto	6070do						7135as	7325na	6175na
0100-0200	Canada, CFVP Calgary	6030do						9915na	11750sa	11955as
0100-0200	Canada, CHNX Halifax	6130do						15260sa	15280as	15360pa 1
0100-0200	Canada, CKZU Vancouver	6160do						9850af	13760na	17555as
0100-0200 sm	Canada, RCI Montreal	9535am	9755am	11845am	11940am	0100-0200	USA, CSMonitor Boston MA	17865as		
		13720am				0100-0200 sa	USA, CSMonitor Boston MA	15725am		
0100-0130 twhf	Canada, RCI Montreal	5960na	9755na			0100-0200	USA, KCBI Dallas TX	7510na		
0100-0200	Costa Rica, RFPI Santa Ana	7375am	7385na	13630am	15030am	0100-0200	USA, KTVB Salt Lk City UT	17775am		
0100-0200	Cuba, Radio Havana Cuba	6010na	9815na			0100-0200	USA, KVOH Los Angeles CA	5995am	6130am	7205as
0100-0127	Czech Republic, R Prague	5930na	7345na	9580na				7651as	9455am	9670va
0100-0200	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am			9775am	11580am	11705am
0100-0150	Germany, Deutsche Welle	6040na	6085na	6120na	6145na			15205am	15250as	17740as
		9515na	9565na	9610na	9770na					21550as
		11865na				0100-0200	USA, WHRI Noblesville IN	7315am		
0100-0200	Guam, KSDA Agana	15610as				0100-0200	USA, WINB Red Lion PA	15145na		
0100-0130	Iran, VOIRI Tehran	9022am	11790am	15260am		0100-0200	USA, WJCR Upton KY	7490na	13595na	
0100-0120	Italy, RAI Rome	9575am	11800am			0100-0200	USA, WRNO New Orleans LA	7355na		
0100-0200	Japan, Radio	11840me	15195as	17810as	17835as	0100-0200	USA, WWCN Nashville TN	5935na	7435na	
		17845as				0100-0200	USA, WYFR Okeechobee FL	6065am	9505am	15440am
0100-0200	Namibia, Namibia BC Corp	3290af				0100-0130	Uzbekistan, R Tashkent	5955as	5995as	7325as
0100-0125	Netherlands, Radio	6020na	6165na	7305as	9860as			9740as	9755as	11975as
		11655as	11835na			0100-0130	Yugoslavia, Radio	9580am		
0100-0200	New Zealand, R NZ Intl	17770pa				0130-0200	Albania, R Tirana Intl	9580na	11840na	
0100-0130 sm	Norway, Radio Norway Intl	9565am				0130-0200	Austria, R Austria Intl	9870sa	9875na	13730na
0100-0200	Philippines, FEBC Manila	15450as				0130-0150 mtwhfa	Greece, Voice of	9395na	9420na	11645na
0100-0200	Russia, Radio Moscow	6000va	6045va	7115na	7150as	0130-0200	Netherlands, Radio	9860as	11655as	12025as
		7295va	9725va	9750va	9870va	0130-0200	United Kingdom, BBC London	5965as	5975na	6005na
		9875na	11655va	11775as	12015as			7325na	9590na	9915na
		12050na	15425na	17655as	17825va			11955va	15260sa	15360va
		17890as	21480na	21530va	21690va			17790va		
		21770va	21790va			0145-0200 smtwthf	Finland, Radio	9560na	11755na	
0100-0200 vl	S Africa, Radio Orion	4810af				0145-0200	Vatican State, Vatican R	9650as	11935as	

SELECTED PROGRAMS

Sundays

- 0100 KSDA, Guam: Your Story Hour. Children's drama.
 0100 Radio For Peace Int'l: FIRE. Programming produced by women worldwide on women's issues.
 0101 BBC: Play Of The Week. "Mad Money" (4th); "A Scourge Of Hyacinths" (11th); "Man Of The Moment" (18th, begins at 0030 UTC); Shakespeare's "Venus And Adonis" (25th).
 0105 Radio Korea: From Us To You. Listener letters, questions, and comments, interspersed with Korean music.
 0115 Radiotelevisione Italiana: Tunes For Whistling. Italian popular and jazz music.
 0130 KSDA, Guam: Voice Of Prophecy. H Richards' devotional.

Mondays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0101 BBC: Feature/Drama: What do athletes do in preparation for competition? Pam Dixon finds out in "Breakfast Of Champions" (through May 3rd).
 0105 Radio Korea: Shortwave Feedback. See S 0635.
 0115 BBC: Feature. Louis Sarno plays African Pygmy music on "Song From The Forest" (5th); Roger Hardy re-examines "The Making Of The Middle East" (through May 3rd).
 0115 KSDA, Guam: Bible In Living Sound. See S 2315.
 0115 Radiotelevisione Italiana: No Parking. Italian popular music.
 0130 KSDA, Guam: Greatest Story Ever Told. A Bible reading.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Musical Feature. John Steane looks back on the career of bass Ezio Pinza in "Mastersingers" (5th); Frank Renton profiles wind and brass bands in "World Bandstand" (through May 17th).
 0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Tuesdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.

- 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0105 BBC: Outlook. See M 1405.
 0110 Radio Korea: Tales From Korea's Past. See M 0640.
 0115 KSDA, Guam: Bible In Living Sound. See S 2315.
 0115 Radiotelevisione Italiana: Light Music. Italian popular, jazz.
 0130 BBC: Folk Routes. Ian Anderson presents a selection of roots music.
 0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Health Matters. New medical developments and methods of keeping fit.
 0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Wednesdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0105 BBC: Outlook. See M 1405.
 0110 Radio Korea: Korean Cultural Variety. See T 0640.
 0115 KSDA, Guam: Bible In Living Sound. See S 2315.
 0115 Radiotelevisione Italiana: Window On The Bay. Selections of Italian music.
 0130 BBC: Talks. John Pickford looks at victims of history in "A Bad Press?" (7th, 14th, 21st); Tony Dorte talks with smallbusiness experts in "Sound Business" (thru June 9th).
 0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Country Style. David Allan profiles the country music scene on both sides of the pond.
 0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Thursdays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0105 BBC: Outlook. See M 1405.
 0110 Radio Korea: Pulse Of Korea. See W 0640.

- 0115 KSDA, Guam: Bible In Living Sound. See S 2315.
 0115 Radiotelevisione Italiana: Light Music. See T 0115.
 0130 BBC: Waveguide. See W 0415.
 0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 0140 BBC: Book Choice. See W 0425.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: The Farming World. An examination of agriculture, forestry, and fishing worldwide.
 0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Fridays

- 0100 KSDA, Guam: Music Scrapbook. See S 2300.
 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0105 BBC: Outlook. See M 1405.
 0110 Radio Korea: Forward To Reunification. See H 0640.
 0115 KSDA, Guam: Bible In Living Sound. See S 2315.
 0115 Radiotelevisione Italiana: Light Music. See T 0115.
 0130 BBC: Seven Seas. Malcolm Billings presents news about ships and the sea.
 0130 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Global Concerns. An update on environmental issues.
 0145 KSDA, Guam: Voice Of Prophecy. See S 0130.

Saturdays

- 0100 KSDA, Guam: Your Story Hour. See S 0100.
 0100 Radio For Peace Int'l: FIRE. See S 0100.
 0105 BBC: Outlook. See M 1405.
 0110 Radio Korea: Let's Learn Korean! See F 0640.
 0115 Radiotelevisione Italiana: Contrast In Music. Selections of Italian music.
 0130 BBC: Short Story (except 3rd: Seeing Stars). See S 0430.
 0130 KSDA, Guam: Power To Cope. See S 1630.
 0145 BBC (as): South Asia Report. See S 0315.
 0145 BBC: Jazz Now And Then. George Reid presents a mix.

0200 UTC

[10:00 PM EDT/7:00 PM PDT]

FREQUENCIES

0200-0300	Australia, ABC Brisbane	4920do	9660do				0200-0300	Taiwan, VO Free China	5950na	9680na	9765pa	11740ca
0200-0300	Australia, ABC Perth	6070do	9610do						11860as	15345as		
0200-0300	Australia, Radio	11720pa	11880va	15240pa	15320as		0200-0300	Thailand, Radio	9655as	11905as		
		15365pa	17670pa	17715pa	17750as		0200-0230	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
		17795as	17880as	21525pa	21590as				7135as	7325na	9410eu	9580as
		21740au							9590na	9670me	9915na	11750sa
0200-0300	Canada, CFCX Montreal	6005do							11955as	12095va	15260sa	15280as
0200-0300	Canada, CFRX Toronto	6070do							15360pa	15380as	17790as	21715as
0200-0300	Canada, CFVP Calgary	6030do					0200-0300	USA, CSMonitor Boston MA	5850na	9350af	13760sa	
0200-0300	Canada, CHNX Halifax	6130do					0200-0300 sa	USA, CSMonitor Boston MA	17555as	17865as		
0200-0300	Canada, CKZU Vancouver	6160do					0200-0230	USA, KCBI Dallas TX	15725va			
0200-0300 twhfa	Canada, RCI Montreal	9535sa	9755sa	11845sa	11940sa		0200-0300	USA, KCBI Dallas TX	9815am			
		13720sa					0200-0300	USA, KTVB Salt Lk City UT	7510am			
0200-0300	Costa Rica,RFPI Santa Ana	7375na	7385na	13630na	15030na		0200-0300	USA, KVOH Los Angeles CA	17775am			
0200-0300	Cuba, Radio Havana Cuba	6010na	9655na				0200-0230 twhfa	USA, VOA Washington DC	5995am	7405am	9775am	11580am
0200-0300	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am				15120am	15205am		
0200-0300	Egypt, Radio Cairo	9475na	11865na				0200-0300	USA, VOA Washington DC	7115as	7205as	7651as	9740as
0200-0210 smtwthf	Finland, Radio	9560na	11755na						11705as	15250as	17740as	21550as
0200-0250	Germany, Deutsche Welle	6035as	7285as	9615as	9690as		0200-0300	USA, WHRI Noblesville IN	7315na			
		9815as	11945as	12065as			0200-0300	USA, WINB Red Lion PA	15145eu			
0200-0300 as	Guam, KSDA Agana	13720as					0200-0300	USA, WJCR Upton KY	7490na	13595na		
0200-0300	Hungary, Radio Budapest	6110na	9835na	11910na			0200-0300 vi	USA, WRNO New Orleans LA		7355am		
0200-0230 mtwhfa	Kenya, Voice of	4935do					0200-0300	USA, WWCN Nashville TN	5935va	7435am		
0200-0300 smtwh	Malaysia, RTM Radio 4	7295do					0200-0300	USA, WYFR Okeechobee FL	5985am	6065am	9505am	15440am
0200-0300	Namibia, Namibia BC Corp	3290af					0200-0230	Yugoslavia, Radio	9580na	11870na		
0200-0300	Netherlands, Radio	9860as	11655as	12025as			0205-0238	Honduras,La Voz Mosquitia	4911do			
0200-0300	New Zealand, R NZ Intl	17770pa					0205-0230 tes-vi	Moldova, R Moldobva Intl	7125am			
0200-0230 sm	Norway, Radio Norway Intl	9565na					0215-0300 unconfm	Iraq, Radio Iraq Intl	11860am			
0200-0230	Philippines, FEBC Manila	15450as					0230-0300	Albania, R Tirana Intl	9580na	11840na		
0200-0300	Romania, R Romania Intl	5990am	6155am	9510am	9570am		0230-0300 s	Kenya, Voice of	4935do			
		11830am	11940am				0230-0245	Pakistan, Radio	9515as	17705as	17725as	21485as
0200-0300	Russia, Radio Moscow	7115na	7150va	9775va	9830va				21730as			
		9870va	9890va	11775va	12015va		0230-0300	Philippines, FEBC Manila	17760as	17840as	21580as	
		12050na	15425na	17570as	17655as		0230-0300	Philippines, R Pilipinas	17760va	17840va	21580va	
		17890va	21480na	21585as	21690as		0230-0300 twhfa	Portugal, Radio	9570am	9600am	9705am	11840am
		21790va					0230-0300	United Kingdom,BBC London	5975na	6005sa	6175na	6195eu
0200-0300	S Africa, Channel Africa	11745af							7135me	7325na	9670me	9915na
0200-0300 vi	S Africa, Radio Orion	4810do							11750sa	11955me	12095va	15260sa
0200-0300	Singapore, SBC1	5010do	5052do	11940do					15280as	15360pa	15390va	17790va
0200-0227	Slovakia, Bratislava	5930am	9580am						21715as			
0200-0300	Sri Lanka, SLBC Colombo	6005as	9720as	15425as			0245-0300	India, All India Radio	3945as	7110as	11830as	15120as
0200-0230	Sweden, Radio	9695na	11705na						15220as			
0200-0230	Switzerland, Swiss R Intl	6135am	9650am	9885am	12035am		0250-0300	Vatican State, Vatican R	7305na	9605na		

SELECTED PROGRAMS

Sundays

- 0200 KSDA, Guam: AWR Magazine. Stories about science,
nature, discoveries, and health matters.
- 0200 Radio For Peace Int'l: World Of Radio. Glenn Hauser's
communications program for shortwave radio listeners.
- 0205 Swiss Radio Int'l: Grapevine. See S 0005.
- 0215 KSDA, Guam: DX Asiawaves. News from the world of
shortwave radio.
- 0218 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S
0018.
- 0230 BBC: Feature. This month, Aziz Rashid visits communities
of "Indians Abroad."
- 0230 KSDA, Guam: Digging Up The Past. No details available.
- 0230 Radio For Peace Int'l: RFPI Reports. Human rights, the
environment, and other critical issues facing the world.
- 0245 KSDA, Guam: Probe. A Bible study program.

Mondays

- 0200 Radio For Peace Int'l: Food For The Thoughtful. Current dietary trends and how they affect our health.
- 0205 Swiss Radio Int'l: Feature. See S 0605.
- 0230 BBC: Composer Of The Month. Profiles of famous classical-music composers. This month: Kurt Weill.
- 0230 Radio For Peace Int'l: RFPI Reports. See S 0230.

- 0245 Radio For Peace Int'l: United Nations. Current events programming produced by UN Radio.

Tuesdays

- 0200 Radio For Peace Int'l: Peace Forum. See S 0300.
0205 Swiss Radio Int'l: Dateline. See M 0605.
0230 BBC: Quiz. See M 1215.
0230 Radio For Peace Int'l: RFPI Reports. See S 0230.
0245 Radio For Peace Int'l: United Nations. See M 0245.

Wednesdays

- 0200 Radio For Peace Int'l: Amnesty Int'l Reports or The CFRU
Series. Human-rights reports, or current-affairs issues from
a student-radio viewpoint.
- 0205 Swiss Radio Int'l: Dateline. See M 0605.
- 0230 BBC: Development '93. Aid and development issues for
developing nations.
- 0230 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0245 Radio For Peace Int'l: Along The Color Line. Manning
Marable looks at issues relevant to the black community.

Thursdays

- 0200 Radio For Peace Int'l: Second Opinion. A weekly conversation with Erwin Knoll, editor of *The Progressive*.

- 0205 Swiss Radio Int'l: Dateline. See M 0605.
0230 BBC: Sports International. Live play-by-play, interviews,
features, and discussions from the sports world.
0230 Radio For Peace Int'l: RFPI Reports. See S 0230.
0245 Radio For Peace Int'l: UNESCO. See M 2330.

Fridays

- 0200 Radio For Peace Int'l: Living Enrichment Center. See M 0400.
0205 Swiss Radio Int'l: Dateline. See M 0605.
0230 BBC: Drama. See H 1130.
0230 Radio For Peace Int'l: RFPI Reports. See S 0230.
0245 Radio For Peace Int'l: The Neumaier Report. Life experiences and opportunities from a spiritual perspective.

Saturdays

- 0200 KSDA, Guam: Digging Up The Past. See S 0230.
0200 Radio For Peace Int'l: Common Ground. See W 2300.
0205 Swiss Radio Int'l: Dateline. See M 0605.
0215 KSDA, Guam: Focus On Living. Life's problems and their solutions.
0230 BBC: People And Politics. Background to the British political scene.
0230 KSDA, Guam: Power To Cope. See S 1630.
0230 Radio For Peace Int'l: RFPI Reports. See M 0230.

0300 UTC

[11:00 PM EDT/8:00 PM PDT]

FREQUENCIES

0300-0400	Australia, ABC Brisbane	4920do	9660do		
0300-0400	Australia, ABC Perth	9610do			
0300-0400	Australia, Radio	11720pa	11880va	15240pa	15320as
		15365as	17670as	17715pa	17750as
		17795pa	17880as	21525as	21590as
		21740pa			
0300-0400	Bulgaria, Radio Sofia	7290ev	9700na	11720na	
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	China, China Radio Intl	9690na	9770na	11715na	
0300-0400	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na	15030na
0300-0400	Cuba, Radio Havana Cuba	6010na	9655na		
0300-0330	Czech Republic, R Prague	5930na	7345na	9810na	
0300-0400	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0300-0330	Egypt, Radio Cairo	9475na	11865na		
0300-0350	Germany, Deutsche Welle	6045na	6055na	6085na	6120na
		9535na	9545na	9640na	9705na
		9770na			
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 m	Honduras, La Voz Evangel.	4820do			
0300-0400 sm	Honduras, R Luz y Vida	3250ca			
0300-0400	Iraq, Radio Iraq Intl	11860am			
0300-0400	Japan, Radio	5960am	15230na	17765as	17810as
0300-0330 N Am Sv	Japan, RJ Regional Svc	15325ca	17825na	21610na	
0300-0400	Kenya, Voice of	4935do			
0300-0400 smtwh	Malaysia, RTM Radio 4	7295do			
0300-0325	Netherlands, Radio	9860as	11655as	12025as	
0300-0400	New Zealand, R NZ Intl	17770pa			
0300-0330	Philippines, FEBC Manila	17760as	17840as	21580as	
0300-0330	Philippines, R Pilipinas	17760va	17840va	21580va	
0300-0400	Russia, Radio Moscow	7115na	7150na	9480na	9685va
		9715na	9775va	9830va	11895va
		12015va	12050na	15350as	15425va
		17570as	17590as	17655as	17755as
		17890va	21690as		
0300-0400	S Africa, Channel Africa	7270af	11745af		
0300-0400	S Africa, Radio Oranje	3230do			

0300-0400	Singapore, SBC1	5010do	5052do	11940do	
0300-0400	Sri Lanka, SLBC Colombo	9720as	15425as		
0300-0400	Taiwan, VO Free China	5950na	9680na	9765as	11745as
		15345na			
0300-0400	Tanzania, Radio	5985af	9685af	11765af	
0300-0400	Thailand, Radio	9655as	11905as		
0300-0330	United Kingdom, BBC London	5975na	6005va	6175na	6180eu
		7120eu	7325na	9410eu	9600af
		9915na	11730af	11750va	11760me
		15260sa	15310as	17790as	21715va
0300-0400	USA, CSMonitor Boston MA	5850na	17865as		
0300-0400 sa	USA, CSMonitor Boston MA	17555as			
0300-0400	USA, KCBI Dallas TX	9815am			
0300-0400	USA, KTN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9785sa			
0300-0330	USA, VOA Washington DC	5965eu	6035af	7270af	11890af
		11905me	15160me	17810eu	17895me
0300-0400	USA, VOA Washington DC	6035af	7265af	7280af	7405af
		9575af	9885af	11835af	11850af
		11890af	11965af	15115af	
0300-0400	USA, WHRI Noblesville IN	7315na			
0300-0400	USA, WJCR Upton KY	7490na	13595na		
0300-0400 vl	USA, WRNO New Orleans LA	7395am			
0300-0400	USA, WWCN Nashville TN	5935na	7435na		
0300-0400	USA, WYFR Okeechobee FL	5985am	6065am	9505am	
0300-0315	Vatican State, Vatican R	7305na	9605na		
0300-0400	Albania, R Tirana Intl	9580na	11825na		
0300-0400	Austria, R Austria Intl	9870ca	13730na		
0300-0355 vl	India, All India Radio	7110as	15120as	15220as	
0300-0400	Netherlands, Radio	9590na	11720na		
0300-0400	UAE, UAE Radio Dubai	11945na	13695eu	15320eu	15435na
0300-0400	United Kingdom, BBC London	3255af	5975na	6005af	6175va
		6180eu	6190af	6195eu	9410eu
		9600af	9915af	11740af	11760me
		11955me	12095eu	15280as	15310as
		15420af	17885af	21715as	
0340-0350 mtwhfa	Greece, Voice of	9395na	9420na	11645na	
0345-0359 varies	Armenia, Radio Yerevan	11675na	11790na	13645am	15580na

SELECTED PROGRAMS

Sundays

- 0300 Radio For Peace Int'l: Peace Forum. Interviews and reports on what constitutes peace.
- 0315 BBC (as): South Asia Report. In-depth analysis of political, economic, and social developments in the subcontinent.
- 0315 BBC: Sports Roundup. News from the world of sports.
- 0330 BBC: From Our Own Correspondent. Reporters comment on the background to the news.
- 0330 Radio For Peace Int'l: RFPI's Mailbag. James and Debra Latham present listener letters, comments, questions, and advice.
- 0335 BBC (af): Postmark Africa. Answers to any question under the sun.
- 0350 BBC: Write On... Listener letters, opinions, and questions.

Mondays

- 0300 Radio For Peace Int'l: New Dimensions Radio. Innovative thinkers and ideas on the leading edge of change.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Anything Goes. See S 1430.
- 0333 BBC (af): Network Africa. Hilton Fyle and the team present information, personalities, and music.

Tuesdays

- 0300 Radio For Peace Int'l: Steppin' Out Of Babylon. Sue Supriano speaks with individuals who fight for freedom and justice.

- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: John Peel. Newly released albums and singles from the contemporary music scene.
- 0330 Radio For Peace Int'l: Voices Of Our World. Interviews and reports about exotic corners of the world.
- 0333 BBC (af): Network Africa. See M 0333.

Wednesdays

- 0300 Radio For Peace Int'l: World Of Radio. See S 0200.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Discovery. An in-depth look at scientific research.

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- 0330 Radio For Peace Int'l: RFPI's Mailbag. See S 0330.
- 0333 BBC (af): Network Africa. See M 0333.

Thursdays

- 0300 Radio For Peace Int'l: Changemakers. See M 0630.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Assignment. A weekly examination of topical issues, from Batman to bandits.
- 0330 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
- 0333 BBC (af): Network Africa. See M 0333.

Fridays

- 0300 Radio For Peace Int'l: Alternative Radio. See T 0400.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: Focus On Faith. Comment and discussion on major issues in the worlds of religion.
- 0333 BBC (af): Network Africa. See M 0333.

Saturdays

- 0300 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
- 0315 BBC: Sports Roundup. See S 0315.
- 0330 BBC: The Vintage Chart Show. Paul Burnett presents classic Top 20 hits. This month: 1989 (3rd); 1979 (10th); 1959 (17th); 1982 (24th).
- 0335 BBC (af): Quiz Of The Week. The Saturday edition of "Focus On Africa," with a radio game show.

0400 UTC

[12:00 AM EDT/9:00 PM PDT]

FREQUENCIES

0400-0500	Australia, ABC Brisbane	4920do	9660do		
0400-0500	Australia, ABC Perth	9610do			
0400-0500 tes	Australia, Gen Eng Svc	17840af			
0400-0500	Australia, Radio	11720pa	11880pa	15240as	15320pa
		15365as	17670pa	17715as	17795as
		17880pa	21525as	21590au	
0400-0404	Botswana, Radio	3356do	4830af	7255af	
0400-0500	Canada, CBC Northern Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, RCI Montreal	9505me	9650eu	9670me	
0400-0500	China, China Radio Intl	11680na			
0400-0500	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na	15030om
0400-0430 varies	Croatian Radio via WHRI	7315na	9495na		
0400-0430	Cuba, Radio Havana Cuba	6010na	6180am	9655na	9815na
0400-0427	Czech Republic, R Prague	5930na	7345na	9810na	11985va
		13715va			
0400-0430	Ecuador, HCJB Quito	9745am	15155am	17490am	21455am
0400-0450	Germany, Deutsche Welle	6065af	6130af	7150af	7225af
		7275af	9665am	9765af	11765af
		13770af			
0400-0430	Guatemala, Radio Cultural	3300do			
0400-0500	Iraq, Radio Iraq Intl	11860am			
0400-0500	Israel, King of Hope	11530as			
0400-0500	Kenya, Voice of	4935do			
0400-0500 smtwf	Malaysia, RTM Radio 4	7295do			
0400-0500 mtwhf	Namibia, Namibia BC Corp	3290af			
0400-0425	Netherlands, Radio	9590na	11720na		
0400-0500	New Zealand, R NZ Intl	15120pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 sm	Norway, Radio Norway Intl	9560na	9650na		
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11830na	11940na		
0400-0500	Russia, Radio Moscow	7150na	7270va	7295va	9665va
		9735va	9870va	11675va	11895va
		12050na	15425na	17765va	17870va
		17890va			
0400-0500	S Africa, Channel Africa	7270af	15345af		
0400-0500 vl	S Africa, Radio Oranje	3230do			
0400-0500	Singapore, SBC1	5010do	5052do	11940do	
0400-0430	Sri Lanka, SLBC Colombo	9720as	15425as		
0400-0430	Switzerland, Swiss R Intl	6135na	9860na	12035na	13635na

0400-0430	Tanzania, Radio	5985af	9685af	11765af	
0400-0430	Thailand, Radio	9655as	11905as		
0400-0500	Turkey, Voice of	9445na			
0400-0430	United Kingdom, BBC London	3255va	5975na	6005af	6175am
		6180eu	6195eu	7105as	7325na
		9410eu	9750eu	9915af	11750va
		11955me	15070va	15280as	15310va
		15575va	15590eu		
0400-0500	USA, CSMonitor Boston MA	5850na	9840af	9870na	13760na
		17780as			
0400-0500 sa	USA, CSMonitor Boston MA	17555as			
0400-0500	USA, KCB Dallas TX	9815am			
0400-0500	USA, KTVN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9785am			
0400-0500	USA, VOA Washington DC	5995me	6035me	6040me	6140me
		6155me	6873me	7170me	7405me
		7265af	7280af	7405af	9575af
		9885af	11835af	11850af	11890af
		11965af	15115af		
0400-0500	USA, WHRI Noblesville IN	7315na	9495sa		
0400-0500	USA, WJCR Upton KY	7490na	13595na		
0400-0500 smtwfh	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA		7395am		
0400-0500	USA, WWCR Nashville TN	5935va	7435na		
0400-0500	USA, WYFR Okeechobee FL	5985am	6065am	9505am	
0425-0440	Italy, RAI Rome	5990eu	7275me		
0430-0500	Cuba, Radio Havana Cuba	6010na	6180na	9815na	
0430-0500	Nigeria, Radio	3326do	4770do		
0430-0500	Russia, AWR Russia	15125eu			
0430-0500	Russia, R Aum Shinrikyo	7315as	9535as	11710as	11915as
		11970as	12025as	13775as	15140as
		15280as	15340as	15375as	15385as
		15415as	15470as	15535as	15545as
		15550as	15590as	17560as	17570as
		17590as	17610as	17620as	17635as
		17655as	17720as	17730as	17740as
		17835as	17850as	17860as	17870as
		17880as	21505as	21515as	21585as
		21685as	21690as	21790as	21830as
0430-0500	Swaziland, TWR	9565af	9655af	11740af	
0430-0500	United Kingdom, BBC London	5975na	6005af	6180eu	6195eu
		9410eu	9600af	9770va	12095va
		15280as	15310va	15400af	15575va
		17885va	21470as		
0430-0500	USA, VOA Washington DC	7265af	7280af	7405af	9575af
0445-0500 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0455-0500	Nigeria, Voice of	7255af			

SELECTED PROGRAMS

Sundays

- 0405 Swiss Radio Int'l: Grapevine. See S 0005.
0415 BBC (af): African Perspective. A look at a major issue affecting Africa.
0415 BBC: Feature. Sandy Walsh profiles "India's Children Of Courage" (4th); Tony Hawks visits local radio stations world wide in "Around The World In 80 Minutes" (11th, 18th, 25th).
0418 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
0430 BBC: Short Story. This month: "Wild Dandelions" (11th); "No Time To Die" (18th); "At The Dentist's Office" (25th) (except 4th: Seeing Stars, a monthly look at astronomy).
0445 BBC: Musical Feature. Robbie Vincent presents "A Taste Of Soul" (4th, 11th, 18th); pop trivia is the fare for host Mark Radcliffe on "Pop The Question" (through June 27th).

Mondays

- 0400 Radio For Peace Int'l: Living Enrichment Center. Life experiences and opportunities from a spiritual perspective.
- 0405 Swiss Radio Int'l: Feature. See S 0605.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Talks. Christopher Cook looks at English life from A to Zed in "An English Alphabet" (through June 28th).
- 0430 BBC: Off The Shelf. This month: Shrilal Skukla's "Raag Darbari" (1st-2nd); Edmund Gosse's "Father And Son" (19th-30th).

- 0430 Radio For Peace Int'l: Sound Currents Of The Earth. Jim Bean presents new age, world, and electronic music.
- 0445 BBC: Andy Kershaw's World Of Music. New and unusual sounds from the world over.

Tuesdays

- 0400 Radio For Peace Int'l: Alternative Radio. Current political issues facing Latin America.
0405 Swiss Radio Int'l: Dateline. See M 0605.
0415 BBC (af): Network Africa. See M 0333.
0415 BBC: Health Matters. See T 0145.
0430 BBC: Off The Shelf. See M 0430.
0445 BBC: Talks. See M 2315.

Wednesdays

- 0400 Radio For Peace Int'l: Seeing Beyond. A talk show on people working for positive planetary change.
- 0405 Swiss Radio Int'l: Dateline. See M 0605.
- 0415 BBC (af): Network Africa. See M 0333.
- 0415 BBC: Waveguide. Tips on how to hear the BBC better.
- 0425 BBC: Book Choice. A short review of a recently released book.
- 0430 BBC: Off The Shelf. See M 0430.
- 0445 BBC: Country Style. See W 0145.

Thursdays

- 0405 Swiss Radio Int'l: Dateline. See M 0605.
0415 BBC (af): Network Africa. See M 0333.
0415 BBC: The Farming World. See H 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio For Peace Int'l: Voices Of Our World. See T 0330.
0445 BBC: From Our Own Correspondent. See S 0330.

Fridays

- 0400 Radio For Peace Int'l: UNESCO. See M 2330.
0405 Swiss Radio Int'l: Dateline. See M 0605.
0415 BBC (af): Network Africa. See M 0333.
0415 BBC: Musical Feature. See M 0145.
0430 BBC: Off The Shelf. See M 0430.
0430 Radio For Peace Int'l: WINGS. See W 0530.
0445 BBC: Folk Routes. See T 0130.

Saturdays

- 0400 Radio For Peace Int'l: World Of Radio. See S 0200.
0405 Swiss Radio Int'l: Dateline. See M 0605.
0415 BBC (af): TalkAbout Africa. Discussion of events from the week just past.
0415 BBC: Good Books. See W 1445.
0430 BBC: Jazz Now And Then. See A 0145.
0430 Radio For Peace Int'l: RFPI's Mailbag. See S 0330.
0445 BBC: Worldbrief. See F 2315.

0500 UTC

[1:00 AM EDT/10:00 PM PDT]

FREQUENCIES

0500-0600	Australia, ABC Brisbane	4920do	9660do		
0500-0600	Australia, ABC Perth	9610do			
0500-0529 tes	Australia, Gen Eng Svc	17840af			
0500-0600	Australia, Radio	11720pa	11880pa	15240pa	15320as
		15365pa	17670as	17715pa	17795as
		17840me	17880as	21525pa	21590as
		21740au			
0500-0600	Canada, CBC Northern Svc	9625do			
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	11840am			
0500-0600	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na	15030na
0500-0600	Cuba, Radio Havana Cuba	9510na			
0500-0600	Ecuador, HCJB Quito	9745am	11925am	21455am	
0500-0550	Germany, Deutsche Welle	5960na	6045na	6120na	6130na
		9535na	9670na	9690na	
0500-0515	Iraq, Radio Iraq Intl	11860am			
0500-0600	Israel, King of Hope	11530as			
0500-0515	Israel, Kol Israel	9435na			
0500-0600 irreg	Italy, IRRS Milan	7125eu			
0500-0600	Japan, Radio	6085me	7230eu	15230na	17765na
		17810na	17825na	21610am	
0500-0600	Kenya, Voice of	4935do			
0500-0505	Lesotho, Radio Lesotho	4800do			
0500-0600	Malaysia, RTM Radio 4	7295do			
0500-0600 mtwhf	Namibia, Namibia BC Corp	3270af	3290af		
0500-0600	New Zealand, R NZ Intl	15120pa			
0500-0600	Nigeria, Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600	Russia, Radio Moscow	5950eu	6165eu	7150na	7165na
		7170va	7180na	7255af	7270va
		7390eu	9870na	9890eu	12050na
		15455va	17570va	17890va	
0500-0600	S Africa, Channel Africa	15430af			
0500-0600	Singapore, SBC1	5052do	11940do		
0500-0600	Spain, Spanish Natl Radio	9530na			
0500-0515 t	Sri Lanka, SLBC Colombo	9720na	15425na		
0500-0530	Swaziland, TWR	5965af	9655af	11740af	

0500-0530	Switzerland, Swiss R Intl	3985eu	6165eu		
0500-0600	Thailand, Radio	9655as	11905as		
0500-0530	United Kingdom, BBC London	5975na	6005af	6180eu	6195eu
			9410eu	9600af	9640na
			12095va	15280as	15310va
			15575as	17830va	17885va
0500-0600	USA, CSMonitor Boston MA	5850na	9840af	9870na	13760na
		17780as			
0500-0600 sa	USA, CSMonitor Boston MA	17555as			
0500-0600	USA, KCBI Dallas TX	9815am			
0500-0600	USA, KTNB Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9785am			
0500-0600	USA, VOA Washington DC	5995me	6035af	6040me	6140me
		7170me	7405af	9530me	9575af
			9635me	9700me	9885af
			11850af	12080me	15115af
			15600af		
0500-0600	USA, WHRI Noblesville IN	7315na	9495na		
0500-0600	USA, WINB Red Lion PA	15145eu			
0500-0600	USA, WJCR Upton KY	7490na	13595na		
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA		7395am		
0500-0600	USA, WWCR Nashville TN	5935na	7435na		
0500-0600	USA, WYFR Okeechobee FL	5985am	9880eu	11915eu	13695eu
0500-0530	Vatican State, Vatican R	9695af	11625af	15090af	
0510-0520 mtwhfa	Botswana, Radio	3356af	4830af	7255af	
0510-0600 vi	S Africa, Radio Oranje	9630do			
0524-0600 f	Ghana, GBC Radio 2	3366do			
0525-0600	Ghana, GBC Radio 1	4915do			
0530-0600	Australia, Defense Dept	17840af			
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410eu
		21490me			
0530-0600	Romania, R Romania Intl	11840af	15380af	17720af	17745af
		17790af	21665af		
0530-0600	Swaziland, TWR	5965af	11740af		
0530-0600	UAE, UAE Radio Dubai	15435as	17830as	21700as	
0530-0600	United Kingdom, BBC London	5975na	6085va	6180as	6190af
		6195eu	9410eu	9640na	9740eu
		15310va	15360va	15400af	15400va
		17885va	21470eu		

SELECTED PROGRAMS

Sundays

- 0500 Radio For Peace Int'l: World Citizen's Hour. A wide variety of opinions, submitted by the citizens of the world.
- 0530 BBC (eu): Europe This Weekend. News and features, pro files, and trends for Europe.

Mondays

- 0530 BBC (eu): Europe Today. The latest news, analysis, and comment for the new Europe.
- 0530 Radio For Peace Int'l: World Goodwill Forum. Goodwill organizations and their effects on the world.

Tuesdays

- 0500 Radio For Peace Int'l: United Nations. See M 0245.
- 0515 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio For Peace Int'l: Peace Forum. See S 0300.

Wednesdays

- 0500 Radio For Peace Int'l: UNESCO. See M 2330.
- 0515 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio For Peace Int'l: WINGS. Current affairs and analysis of women's issues.



*The BBC's Andy Kershaw —
"World of Music"*

Thursdays

- 0500 Radio For Peace Int'l: United Nations. See M 0245.
- 0515 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio For Peace Int'l: Vietnam Veterans Radio Network. See S 0630.

Fridays

- 0500 Radio For Peace Int'l: Dialogue. See T 2330.
- 0515 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio For Peace Int'l: Steppin' Out Of Babylon. See T 0300.

Saturdays

- 0500 Radio For Peace Int'l: United Nations. See M 0245.
- 0515 Radio For Peace Int'l: RFPI Reports. See S 0230.
- 0530 BBC (eu): Europe Today. See M 0530.
- 0530 Radio For Peace Int'l: Outlaw For Peace. Country music's Willie Nelson comes to shortwave.

0600 UTC

[2:00 AM EDT/11:00 PM PDT]

FREQUENCIES

0600-0630	Australia, Radio	11720pa	11880pa	15240pa	15320pa
		15365pa	17715pa	17760pa	17880pa
		21525pa	21590pa	21740pa	
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0700	Costa Rica, RFPI Santa Ana	7375na	7385na	13630am	15030na
0600-0700	Cuba, Radio Havana Cuba	6000na	9510na		
0600-0700	Ecuador, HCJB Quito	11925am	15155am	21455am	
0600-0650	Germany, Deutsche Welle	11765af	13610af	13790af	15185af
		15435af	17875af		
0600-0700	Ghana, GBC Radio 1	4915do			
0600-0700 f	Ghana, GBC Radio 2	3366do			
0600-0630	Georgia, Georgian Radio	11805.3			
0600-0700 irreg	Italy, IRRS Milan	7125eu			
0600-0625	Kenya, Voice of	4935do			
0600-0700	Kiribati, Radio	17440do			
0600-0630 s	Latvia, Radio Riga	5935eu			
0600-0700	Lebanon, King of Hope	6280me			
0600-0700 smtwha	Malaysia, RTM Radio 4	7295do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295as	
0600-0700	Malta, V of Mediterranean	9765eu			
0600-0658	New Zealand, R NZ Intl	15120pa			
0600-0700 s	New Zealand, ZLXA	3935do			
0600-0700	Nigeria, Radio	3326do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0650	North Korea, R Pyongyang	15180as	15230as		
0600-0645	Romania, R Romania Intl	7225eu	9510eu	9570eu	11775eu
0600-0700	Russia, Radio Moscow	5905af	7150na	7165na	7170va
		7175va	7180na	7270na	7345as
		9860va	9870va	9890eu	17570va
0600-0700	S Africa, Channel Africa	15430af			
0600-0700 vl	S Africa, Radio Oranje	9630do			
0600-0700	Singapore, SBC1	5010do	5052do	11940do	
0600-0700	South Korea, Radio Korea	7275na	11945na	15155na	
0600-0700	Swaziland, TWR	5965af	11740af		
0600-0630	Switzerland, Swiss R Intl	9860af	13635af	17565af	
0600-0615	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0600-0700 sa	Thailand, Radio	9655as	11905as		
0600-0630	United Kingdom, BBC London	5975na	6180eu	6195eu	7150pa
		9410eu	9590na	9640af	9750eu
		11940af	15280va	15360as	15400va
		15420af	17790sa	17830va	
0600-0700	USA, CSMonitor Boston MA	5850na	7395eu	17555as	17780as
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KCBI Dallas TX	9815am			
0600-0700	USA, KTNB Salt Lk City UT	7510na			
0600-0700	USA, KVOH Los Angeles CA	9785na			
0600-0700	USA, VOA Washington DC	3980eu	5995eu	6005af	6035af
		6040eu	6060me	6873eu	7325me
		7405af	9530af	9575af	9885af
		11850af	11925af	12080af	15115af
		15600af			
0600-0700	USA, WHRI Noblesville IN	7315eu	9495am		
0600-0700	USA, WJCR Upton KY	7490na	13595na		
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WWCR Nashville TN	5935na	7435na		
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	9680af	11915af
		13695af			
0600-0620	Vatican State, Vatican R	6245eu	7250eu		
0603-0610	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0615-0700 mtwhf	Canada, RCI Montreal	6150eu	7155eu	9740af	9760eu
		11935af			
0625-0700	Kenya, Voice of	4935do			
0630-0700	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		15300pa	15365pa	17670pa	17715pa
		17880pa	21525pa	21590pa	21740pa
0630-0700	Austria, R Austria Intl	6015na			
0630-0655	Belgium, R Vlaanderen	5910eu	9905va	11695pa	
0630-0700 smtwhf	New Zealand, ZLXA	3935do			
0630-0700	United Kingdom, BBC London	5975na	6180eu	6195eu	7150pa
		9410eu	9640va	9750eu	11760me
		11940af	11955as	12095eu	15280as
		15400af	17790as	17885va	
0630-0700	Vatican State, Vatican R	9695af	11625af	15090af	
0635-0700	Monaco, TWR Monte Carlo	9480eu			
0645-0700	Finland, Radio	6120af	9560me	11755eu	
0645-0700	Ghana, GBC	6130af			
0645-0700	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		

SELECTED PROGRAMS

Sundays

- 0600 Radio For Peace Int'l: From The Atom To The Universe. Robert Muller explains the impact of scientific research.
- 0605 BBC (af): Postmark Africa. See S 0335.
- 0605 Swiss Radio Int'l: Feature. Programs broadcast on a rotating basis are "Supplement" (news analysis), "Roundabout Switzerland" (travel/discovery), "Swiss Music," and "The Name Game" (Swiss game show).
- 0615 BBC: Letter From America. Alistair Cooke shares his intimate view of American life.
- 0615 Radio Korea: Echoes Of Korean Music. o details available.
- 0630 BBC (af): African Perspective. See S 0415.
- 0630 BBC: Jazz For The Asking. Digby Fairweather plays requests.
- 0630 Radio For Peace Int'l: Vietnam Veterans Radio Network. A critical examination of U participation in the Vietnam War.
- 0635 Radio Korea: Shortwave Feedback. Listener letters, opinions, and suggestions, and news about shortwave radio.

Mondays

- 0605 Swiss Radio Int'l: Dateline. Analysis on world events and a closer look at the Swiss national fabric.
- 0615 BBC: Recording Of The Week. A personal choice of new classical music releases.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0620 Radio Korea: Seoul Calling. Music, features, and short interviews relating to Korea.
- 0630 BBC: Feature. See S 1401.
- 0630 Radio For Peace Int'l: Changemakers. Gini Scott with interviews on topical themes.
- 0633 BBC (af): Network Africa. See M 0333.
- 0640 Radio Korea: Tales From Korea's Past. The history of Korea.

Tuesdays

- 0600 Radio For Peace Int'l: Peace Talks. Brief talks on subjects such as peace education and development and peace.
- 0605 Swiss Radio Int'l: Dateline. See M 0605.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0620 Radio Korea: Seoul Calling. See M 0620.
- 0630 BBC: Rock/Pop Music. Hindi film music is featured in "Music For The Millions" (6th, 13th); to mark her 75th birthday, Ella Fitzgerald is profiled in "Ella" (20th, 27th).
- 0630 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
- 0633 BBC (af): Network Africa. See M 0333.
- 0640 Radio Korea: Korean Cultural Variety. A look at Korean cultural and artistic traditions.

Wednesdays

- 0600 Radio For Peace Int'l: Peace Forum. See S 0300.
- 0605 Swiss Radio Int'l: Dateline. See M 0605.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0620 Radio Korea: Seoul Calling. See M 0620.
- 0630 BBC: Meridian. Events in the world of the arts.
- 0633 BBC (af): Network Africa. See M 0333.
- 0640 Radio Korea: Pulse Of Korea. Korean development.

Thursdays

- 0600 Radio For Peace Int'l: Sound Currents Of The Earth. M 0430.
- 0605 Swiss Radio Int'l: Dateline. See M 0605.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0620 Radio Korea: Seoul Calling. See M 0620.

- 0630 BBC: Sports International. See H 0230.
- 0633 BBC (af): Network Africa. See M 0333.
- 0640 Radio Korea: Forward To Reunification. The prospects for reunion between North and South Korea.

Fridays

- 0600 Radio For Peace Int'l: Food For The Thoughtful. See M 0200.
- 0605 Swiss Radio Int'l: Dateline. See M 0605.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0620 Radio Korea: Let's Sing Together. A sing-along program, featuring the always-popular Song of the Month.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio For Peace Int'l: The Practice of Peacemaking. Ian Harris on problems of violence in the world.
- 0633 BBC (af): Network Africa. See M 0333.
- 0640 Radio Korea: Let's Learn Korean! Korean language lessons for native English speakers.

Saturdays

- 0600 Radio For Peace Int'l: Peace Forum. See T 0200.
- 0605 BBC (af): Quiz Of The Week. See A 0335.
- 0605 Swiss Radio Int'l: Grapevine. See S 0005.
- 0615 BBC: The World Today. See M 1645.
- 0615 Radio Korea: News Commentary. See S 0045.
- 0618 Swiss Radio Int'l: Swiss SW Merry-Go-Round. See S 0018.
- 0620 Radio Korea: Sites And Sounds. See S 0050.
- 0630 BBC (af): Spice Taxi. A look at African culture, from presidential style to cult films.
- 0630 BBC: Meridian. See W 0630.
- 0630 Radio For Peace Int'l: Second Opinion. See H 0200.
- 0635 Radio Korea: From Us To You. See S 0105.

0700 UTC [3:00 AM EDT/12:00 AM PDT]

0700-0800	Australia, ABC Perth	15425pa			
0700-0730	Australia, Radio	6020pa	11720va	11880pa	15240pa
		15320va	15365pa	17695as	17715pa
		17750as	21525pa	21590pa	21740pa
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na	15030na
0700-0730	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
		17725as	21705as		
0700-0800	Ecuador, HCJB Quito	6205eu	9745eu	11835eu	11925eu
		21455eu			
0700-0800	Ghana, GBC	6130af			
0700-0800	Ghana, GBC Radio 1	4915do			
0700-0800 f	Ghana, GBC Radio 2	3366do			
0700-0800 irreg	Italy, IRRS Milan	7125eu			
0700-0800	Japan, Radio	5970eu	6025eu	15170au	17765eu
		17810as	17860as	21575me	
0700-0800	Kenya, Voice of	4935do			
0700-0800	Lebanon, King of Hope	6280me			
0700-0800 last a	Lithuania, Radiocentras	9710eu			
0700-0800 smtwha	Malaysia, RTM Radio 4	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295as	
0700-0800	Monaco, TWR Monte Carlo	9480eu			
0700-0800	New Zealand, R NZ Intl	9700pa			
0700-0800 smtwhf	New Zealand, ZXLA	3935do			
0700-0800	Nigeria, Radio	3326do	4990do		
0700-0750	North Korea, R Pyongyang	15350as	17765as		
0700-0715	Romania, R Romania Intl	11810pa	11940pa	15335pa	17720pa
		17805pa	21665pa		
0700-0800	Russia, Radio Moscow	5905va	7175va	7345va	9490eu
		9890va	12010af	12055af	13650va
		13705va	15190va	15280af	15345af
		15440eu	15465af	15470af	15520af
		15540va	15550af	17580eu	17655af
0700-0800	Russia, Radio Moscow	17675af	17860eu		
0700-0800 vl	S Africa, Radio Oranje	9630do			
0700-0800	Singapore, SBC1	5010do	5052do	11940do	
0700-0800	Swaziland, TWR	7200af	11740af		
0700-0715	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
0700-0800	Taiwan, VO Free China	5950na			
0700-0800 sa	Thailand, Radio	9655as	11905as		
0700-0730	United Kingdom, BBC London	3955na	5970eu	5975na	6025eu
		6195eu	7150pa	7325af	9410eu
		9640va	9750eu	11940af	15325eu
		15360pa	15400af	17885va	21470va
0700-0800	USA, CSMonitor Boston MA	5850eu	7395am	9445na	9840va
		9870am	17555as	17780as	
0700-0800	USA, KCBI Dallas TX	9815am			
0700-0800	USA, KTNB Salt Lk City UT	7510na			
0700-0800	USA, KVOH Los Angeles CA	9785na			
0700-0800	USA, WHRI Noblesville IN	7315eu	9495am		
0700-0800	USA, WJCR Upton KY	7490na	13595na		
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	5935va	7435am		
0700-0800	USA, WYFR Okeechobee FL	5985va	7355va	9680va	11915af
		13695eu			
0703-0715	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0730-0800	Australia, Radio	6020pa	11720pa	11880pa	15240pa
		17695pa	17750as	21525as	21590as
0730-0800	Finland, Radio	17800as	21550as		
0730-0745 mtwhf	Iceland, Natl BC Service	9265om			
0730-0735	India, All India Radio	15250as	17850as		
0730-0800	Italy, AWR Europe	7210eu			
0730-0800	Netherlands, Radio	9630pa	11895pa		
0730-0800	United Kingdom, BBC London	5970eu	6195na	7150pa	7325eu
		9410eu	9640va	9660va	9750eu
		9760eu	9915af	15310va	15400af
		15420va	17790va	17830va	17885va
0730-0745 mtwhfa	Vatican State, Vatican R	6245do	7250do	9645na	15210na

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0900	Australia, ABC Brisbane	9660do			
0800-0900	Australia, ABC Perth	15425va			
0800-0830	Australia, Radio	5995pa	9560pa	9580pa	15240pa
		17695pa	17750pa	21590as	25750as
0800-0900 tes	Australia, Somali Forces	25750af			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica, RFPI Santa Ana	7375na	7385na	13630am	15030na
0800-0830	Ecuador, HCJB Quito	6205eu	11835eu	11925eu	21455eu
0800-0900	Finland, Radio	17800as	21550as		
0800-0900	Ghana, GBC Radio 1	4915do			
0800-0900 f	Ghana, GBC Radio 2	3366do			
0800-0900 asmtwh	Guam, KTWB Agana	15200as			
0800-0900 irreg	Italy, IRRS Milan	7125eu			
0800-0900	Kenya, Voice of	4935do			
0800-0900	Lebanon, King of Hope	6280me			
0800-0900 smtwha	Malaysia, RTM Radio 4	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295as	
0800-0835	Monaco, TWR Monte Carlo	9480eu			
0800-0825	Netherlands, Radio	9630pa	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0900 smtwhf	New Zealand, ZXLA	3935do			
0800-0900	Nigeria, Radio	3326do	4990do		
0800-0900	Nigeria, Voice of	7255af			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0845	Pakistan, Radio	17900eu	21520eu		
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia, Radio Moscow	4940af	4975af	6110af	7130af
		9580va	11765af	12010va	12020va
		12055af	12070eu	13650va	13705va
		15190eu	15210va	15345va 1	5440va
		17675af	17805af	17860va	21655af
0800-0900 vl	S Africa, Radio Oranje	9630do			
0800-0900	Singapore, SBC1	5010do	5052do	11940do	
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, Radio Korea	7550eu	13670eu		
0800-0820	Swaziland, TWR	7200af	11740af		
0800-0830	United Kingdom, BBC London	6190na	7150pa	9750eu	11940af
		15280as	15360pa	15400na	15420va
		17640va	17790va	17830va	17885va
0800-0900	USA, CSMonitor Boston MA	9445am	9455am	9840am	11705eu
		13615as	15665pa		
0800-0900	USA, KCBI Dallas TX	9815am			
0800-0900	USA, KNLS Anchor Point AK	9615as			
0800-0900	USA, KTNB Salt Lk City UT	7510am			
0800-0900	USA, VOA Washington DC	11735eu	15160eu	15195me	17770me
		21455me	21570me		
0800-0900	USA, WHRI Noblesville IN	7315eu			
0800-0900	USA, WJCR Upton KY	7490na	13595na		
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	5935va	7435am		
0803-0805	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0820-0835 as	Swaziland, TWR	7200af	11740af		
0830-0900	Australia, Radio	5995na	9560pa	9580pa	17695pa
		17750pa	17750as	21590as	25750pa
0830-0900	Austria, R Austria Intl	6155eu	13730eu	15450au	21490as
0830-0900	Ecuador, HCJB Quito	9745au	11925au	21455au	
0830-0900	India, All India Radio	7250as	9610as	11970as	15250as
		17850as			
0830-0900	Netherlands, Radio	11895pa			
0830-0900	United Kingdom, BBC London	6190va	6195eu	7325va	9750eu
		11940eu	15280as	15360pa	15360pa
		15400va	15420va	15575va	17640va
		17790as	17830va	17885va	
0830-0845	Vatican State, Vatican R	6245eu	7250eu	9645eu	15210eu
0835-0850 smtwhf	Monaco, TWR Monte Carlo	9480eu			
0850-0900 s	Monaco, TWR Monte Carlo	9480eu			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-1000	Australia, ABC Brisbane	4920do	9660do		
0900-1000	Australia, Radio	5995pa	9510pa	9580pa	13605as
		15170as	21725as		
0900-0925 mtwhf	Belgium, R Vlaanderen	5910eu	9905eu		
0900-1000 s	Bhutan, BC Service	6035do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755au	15440au	17710au	
0900-0930	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na	
0900-1000	Ecuador, HCJB Quito	9745au	11925au	21455au	
0900-0950	Germany, Deutsche Welle	6160as	11715as	15410af	17780pa
		17820as	21465as	21600af	21650as
		21680as			
0900-0905	Ghana, GBC Radio 1	4915do			
0900-0905 f	Ghana, GBC Radio 2	3366do			
0900-1000	Guam, KTWB Agana	11805pa			
0900-0910	India, All India Radio	9610as	11970as	15250as	17850as
0900-1000 s	Italy, AWR Europe	7230eu			
0900-1000 irreg	Italy, IRRS Milan	7125eu			
0900-1000	Japan, Radio	11815eu	11890eu	21610as	
0900-1000 Pacific	Japan, RJ Regional Svc	15270pa	17860pa		
0900-1000	Kenya, Voice of	4935do			
0900-1000	Lebanon, King of Hope	6280me			
0900-1000	Malaysia, RTM Radio 4	7295do			
0900-0915 s	Monaco, TWR Monte Carlo	9480eu			
0900-0925	Netherlands, Radio	11895pa			
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 mtwhf	New Zealand, ZLXA	3935do			
0900-1000	Nigeria, Radio	3326do	4990do		
0900-1000	Nigeria, Voice of	7255af			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Philippines, FEBC Manila	11690as			
0900-1000	Russia, Radio Moscow	4940af	6110af	7130af	9755af
		11765af	12010va	12020va	12055af
		12070va	13650va	15175va	15210va
		15435va	15440va	15540va	17565va
		17860va	21755va	21825af	21845af
0900-1000 vl	S Africa, Radio Oranje	9630do			
0900-1000	Singapore, SBC1	5010do	5052do	11940do	
0900-0930	Switzerland, Swiss R Intl	9560pa	13685pa	17670pa	21820pa
0900-0930	United Kingdom, BBC London	6190as	6195eu	7180eu	9410eu
		9740eu	9750eu	11765as	15190am
		15575va	17640va	17705va	17790va
		17830va	17885va	21470va	
0900-1000	USA, CSMonitor Boston MA	9445am	9455am	9840eu	11705eu
		13615pa	15665pa		
0900-1000	USA, KCBI Dallas TX	9815am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, VOA Washington DC	11735eu	15160eu	15195me	17770eu
		21455me	21570eu		
0900-1000	USA, WJCR Upton KY	7490na	13595na		
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000	USA, WWCR Nashville TN	5935va	7435am		
0903-0909	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
0905-1000 sa	Ghana, GBC Radio 1	4915do			
0905-1000 mtwhf	Ghana, GBC Radio 2	3366do	7295do		
0905-1000 sa	Ghana, GBC Radio 2	3366do			
0910-0940 smwha	Mongolia, R Ulaanbaatar	11850pa	12015pa		

0915-0930 smtwh	Guam, KTWB Agana	15200as			
0930-0945	India, All India Radio	9610as	11970as	15250as	17850as
0930-1000	Netherlands, Radio	7260as	9720pa	9860pa	11895pa
0930-1000	United Kingdom, BBC London	5975eu	6190na	6195na	7180as
		9410as	9740eu	9750eu	9760eu
		11765as	15575va	17640va	17705va
		21470va			
0940-0950	Greece, Voice of	17525au			

1000 UTC [6:00 AM EDT/3:00 AM PDT]

1000-1100	Australia, Radio	5995pa	9580pa	21725as	
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755au	15440au	17710au	
1000-1100	Costa Rica, AWR Alajuela	9725ca			
1000-1100	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na	
1000-1100	Ecuador, HCJB Quito	9745au	11925au	21455au	
1000-1100 sa	Ghana, GBC Radio 1	4915do			
1000-1100 mtwhf	Ghana, GBC Radio 2	7295do			
1000-1100 sa	Ghana, GBC Radio 2	3366do			
1000-1100	India, All India Radio	15050as	17387as	17895as	21735as
1000-1100	Italy, AWR Europe	7230eu			
1000-1100 irreg	Italy, IRRS Milan	7125eu			
1000-1100	Kenya, Voice of	4935do			
1000-1100	Malaysia, RTM Kuching	7160do			
1000-1100 mtwh	Malaysia, RTM Radio 4	7295do			
1000-1025	Netherlands, Radio	7260as	9720pa	9860as	11895pa
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Radio	4990do	7285do		
1000-1100	Nigeria, Voice of	7255af			
1000-1100	Philippines, FEBC Manila	9800as	11685as		
1000-1100	Russia, Radio Moscow	4975af	6110af	7130af	11765af
		12010eu	12020eu	12070va	13650va
		15175va	15210va	15345eu	15440va
		15465va	15475va	15550af	17565va
		17600eu	17805eu	21550eu	21755va
1000-1100	S Africa, Channel Africa	11900af			
1000-1100 vl	S Africa, Radio Oranje	9630do			
1000-1100	Singapore, SBC1	5010do	5052do	11940do	
1000-1030	United Kingdom, BBC London	5975eu	6190eu	6195eu	9410as
		9740eu	9750eu	15190am	
		9495na	13625as	17555as	
1000-1100	USA, CSMonitor Boston MA	9455am			
1000-1100 sa	USA, CSMonitor Boston MA	13770eu			
1000-1100	USA, KCBI Dallas TX	9815am			
1000-1100	USA, VOA Washington DC	5985as	9590am	11720as	11735me
		11915am	15120am	15160me	15195me
		15425as	17770me	21455me	
1000-1100	USA, WHRI Noblesville IN	9850sa			
1000-1100	USA, WJCR Upton KY	7490na	13595na		
1000-1100	USA, WWCR Nashville TN	5935va	15685va		
1000-1100	USA, WYFR Okeechobee FL	5950am			
1000-1030	Vietnam, Voice of	9840as	12020as	15010as	
1003-1006	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1025-1100	Netherlands, Radio	7260as	9860as		
1030-1100	Austria, R Austria Intl	6155eu	13730as	15450as	21490pa
1030-1100	Bulgaria, Radio Sofia	11630eu	11720eu	13670eu	17780eu
		17825eu			
1030-1100	Iran, VOIRI Tehran	9525as	11715af	11790as	11910as
		11930me			
1030-1100	South Korea, Radio Korea	11715na			
1030-1100	Sri Lanka, SLBC Colombo	11835as	15120as	17850as	
1030-1100	UAE, UAE Radio Dubai	13675eu	15320eu	15435eu	21605eu
1030-1100	United Kingdom, BBC London	5975eu	6190eu	6195eu	9410as
		9740as	9750as	9760as	15190am
		15310va	15420va	15575va	17640va
		17705va	17885va	21470va	
1040-1050	Greece, Voice of	15650as	17525as		
1055-1100	Neth Antilles, TWR Bonaire	11815am	15345am		

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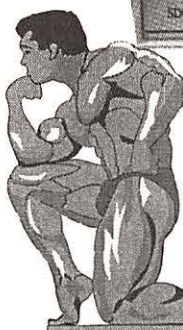
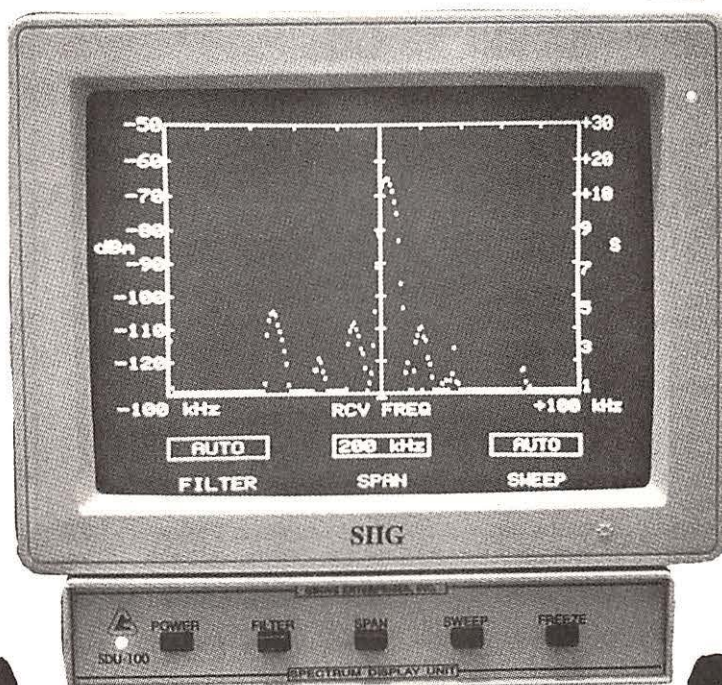
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1100 UTC

[7:00 AM EDT/4:00 AM PDT]

FREQUENCIES

1100-1200	Australia, ABC Brisbane	4920do				1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	13635as	15505as
1100-1200	Australia, Radio	5995pa	6020pa	6080pa	7240pa			17670as			
		9510pa	9580pa	9710pa	13605pa	1100-1200	Taiwan, Voice of Asia	7445as			
		15170pa	21725pa			1100-1130	United Kingdom, BBC London	5965na	6190na	6195eu	9410as
1100-1200	Canada, CFCX Montreal	6005do						9700eu	9740as	9750eu	9760eu
1100-1200	Canada, CFRX Toronto	6070do						15310na	15420va	15575va	17640va
1100-1200	Canada, CFVP Calgary	6030do						17705va	17790va	17885va	21470va
1100-1200	Canada, CHNX Halifax	6130do						9495na	13625as	17555as	
1100-1200	Canada, CKZU Vancouver	6160do				1100-1200	USA, CS Monitor Boston MA	9455am			
1100-1200	Costa Rica, AWR Alajuela	9722ca	11870ca			1100-1200 sa	USA, CS Monitor Boston MA	13770eu			
1100-1200	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na		1100-1200	USA, KCBI Dallas TX	9815am			
1100-1130	Ecuador, HCJB Quito	9745au	11925au	15155au	21455au	1100-1200	USA, KTNB Salt Lake City UT	7510na			
1100-1150	Germany, Deutsche Welle	15410af	17765af	17800af	17860af	1100-1200	USA, VOA Washington DC	5985as	6110as	9590am	9760as
		21465af	21600af					11720as	11915am	15120am	15155as
		4915do						15425as			
1100-1200	Ghana, GBC Radio 1	7295do				1100-1200	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1100-1110 mtwhf	Ghana, GBC Radio 2	3366do				1100-1200	USA, WJCR Upton KY	7490na	13595na		
1100-1200 sa	Ghana, GBC Radio 2	9525af	11515af	11790as	11910as	1100-1200	USA, WWCR Nashville TN	5935va	15685va		
1100-1130	Iran, VOIRI Tehran	11930me				1100-1200	USA, WYFR Okeechobee FL	5950am	7355am		
		17545eu				1100-1130	Vietnam, Voice of	7416as	19732as		
1100-1130	Israel, Kol Israel	7125eu				1115-1145	Nepal, Radio	3230as	5005as	7165as	
1100-1200 irreg	Italy, IRRS Milan	6120na	9750va	11815sa	11840na	1120-1130 mtwhf	Vatican State, Vatican R	6245eu	7250eu	11740eu	15210eu
1100-1200	Japan, Radio	21610as						21670eu			
		7295do				1130-1200	Austria, R Austria Intl	6155eu	11780as	13730va	15450as
1100-1200	Malaysia, RTM Radio 4	11820af	11835af			1130-1155	Belgium, R Vlaanderen	17555as	21810na		
1100-1130	Mozambique, Radio Maputo	11815am	15345am			1130-1157	Czech Republic, R Prague	6055eu	7345eu	9505eu	11990eu
1100-1200	Neth Antilles, TWR Bonaire	7260as	9860as					15355eu			
1100-1125	Netherlands, Radio	9700as				1130-1200	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1100-1200	New Zealand, R NZ Intl	6576na	9977na	11335na		1130-1150 mtwhf	Finland, Radio	11735na	15400na		
1100-1150	North Korea, R Pyongyang	17595eu	17900eu	21520eu		1130-1140	Lesotho, Radio Lesotho	4800do			
1100-1120	Pakistan, Radio	9705va	9780va	9855va	11675va	1130-1200	Netherlands, Radio	5955eu			
1100-1200	Russia, Radio Moscow	11710va	12020na	12070va	13650va	1130-1157	Slovakia, Bratislava	7345va	9505au	11990au	
		15435va	15470va	15475va	15530va	1130-1200	Somalia, Radio Rajo	9540do			
		15550va	15585va	17570va	17600va	1130-1200	South Korea, Radio Korea	9650na			
		17755va	21515va	21755va	21785va	1130-1200	Thailand, Radio	4830as	9655as	11905as	
1100-1200	S Africa, Channel Africa	11900af				1130-1200	United Kingdom, BBC London	5965na	6190eu	6195eu	9410eu
1100-1200 vl	S Africa, Radio Oranje	9630do						9740eu	9750eu	15220na	15420va
1100-1200	Singapore, SBC1	5010do	5052do	11940do				17705va	17885va	21470va	21660af
1100-1200	South Korea, Radio Korea	15575af				1135-1140	India, All India Radio	9675as	11770as	11970as	17705as
1100-1130	Sri Lanka, SLBC Colombo	11835as	15120as	17850as				17815as			

SELECTED PROGRAMS

Sundays

- 1100 Radio For Peace Int'l: Peace Forum. See S 0300.
 1105 Swiss Radio Int'l: Feature. See S 0605.
 1115 Radio Korea: Echoes Of Korean Music. See S 0615.
 1130 BBC: The Ken Bruce Show. See S 0030.
 1130 Radio For Peace Int'l: RFPI's Mailbag. See S 0330.
 1135 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

- 1100 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1115 Radio Korea: News Commentary. See S 0045.
 1120 Radio Korea: Seoul Calling. See M 0620.
 1130 BBC: Composer Of The Month. See M 0230.
 1140 Radio Korea: Tales From Korea's Past. See M 0640.

Tuesdays

- 1100 Radio For Peace Int'l: Steppin' Out Of Babylon. See T 0300.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1115 Radio Korea: News Commentary. See S 0045.
 1120 Radio Korea: Seoul Calling. See M 0620.
 1130 BBC: Megamix. Music, sports, fashion, health, travel, news, and opinion for young people.
 1130 Radio For Peace Int'l: Voices Of Our World. See T 0330.
 1140 Radio Korea: Korean Cultural Variety. See T 0640.

Wednesdays

- 1100 Radio For Peace Int'l: World Of Radio. See S 0200.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1115 Radio Korea: News Commentary. See S 0045.
 1120 Radio Korea: Seoul Calling. See M 0620.
 1130 BBC: Meridian. See W 0630.
 1130 Radio For Peace Int'l: RFPI's Mailbag. See S 0330.
 1140 Radio Korea: Pulse Of Korea. See W 0640.

Thursdays

- 1100 Radio For Peace Int'l: Changemakers. See M 0630.

International Callsign Directory

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- 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1115 Radio Korea: News Commentary. See S 0045.
 1120 Radio Korea: Seoul Calling. See M 0620.
 1130 BBC: Drama. This month: "The Man In Black" (1st, 8th); "Say Something Happened" (15th); "The Border" (22nd); "Simon" (29th).
 1130 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
 1140 Radio Korea: Forward To Reunification. See H 0640.

Fridays

- 1100 Radio For Peace Int'l: Alternative Radio. See T 0400.
 1105 Swiss Radio Int'l: Dateline. See M 0605.
 1115 Radio Korea: News Commentary. See S 0045.
 1120 Radio Korea: Let's Sing Together. See F 0620.
 1130 BBC: Meridian. See W 0630.
 1140 Radio Korea: Let's Learn Korean! See F 0640.

Saturdays

- 1100 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
 1105 Swiss Radio Int'l: Grapevine. See S 0005.
 1115 Radio Korea: News Commentary. See S 0045.
 1118 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
 1120 Radio Korea: Sites And Sounds. See S 0050.
 1130 BBC: Meridian. See W 0630.
 1135 Radio Korea: From Us To You. See S 0105.

1200 UTC

[8:00 AM EDT/5:00 AM PDT]

FREQUENCIES

1200-1300	Australia, ABC Brisbane	4920do			
1200-1300	Australia, ABC Katherine	2485do			
1200-1300	Australia, ABC Perth	6140do	9610do		
1200-1230	Australia, Radio	5995pa	6020pa	6080pa	7240pa
		9580pa	9710pa	21725as	
1200-1300	Brazil, Radiobras	15445am			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1300	China, China Radio Intl	9655na	9715as	11660as	11795pa
		15210na	15440pa		
1200-1300	Costa Rica, AWR Alajuela	9722ca	11870ca		
1200-1300	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na	
1200-1300	Ecuador, HCJB Quito	11925am	15115am	17890am	21455om
1200-1300	Ghana, GBC Radio 1	4915do			
1200-1225 sa	Ghana, GBC Radio 2	3366do			
1200-1300 irreg	Italy, IRRS Milan	7125eu			
1200-1300	Kenya, Voice of	4935do			
1200-1300	Malaysia, RTM Radio 4	7295do			
1200-1230 smwha	Mongolia, R Ulaanbaatar	11850as	12015as		
1200-1230	Neth Antilles, TWR Bonaire	11815am	15345am		
1200-1225	Netherlands, Radio	5955eu			
1200-1205	New Zealand, R NZ Intl	9700as			
1200-1300	Nigeria, Radio	4990do	7285do		
1200-1300	Nigeria, Voice of	7255af			
1200-1230 as	Norway, Radio Norway Intl	17860as	21705as		
1200-1300	Palau, KBN	9830va			
1200-1300	Russia, Radio Moscow	6065va	7160va	7260va	7370va
		9705va	9745va	9780va	9780va
		9855va	11710va	11850va	11980va
		12020va	13650va	15175va	15210va
		15280na	15435va	15465va	15475va
		15510va	15585va	17570va	17735va
		21755va			
1200-1300 vl	S Africa, Radio Oranje	9630do			
1200-1300	Singapore, SBC1	5010do	5052do	11940do	
1200-1230	Thailand, Radio	9655as	11905as		

1200-1230	United Kingdom, BBC London	5965am	6190na	6195na	9410eu
		9740na	13660eu	15220va	15310pa
		15420va	15520na	17640va	17790va
		17885va	21470va		
1200-1300	USA, CS Monitor Boston MA	9425au	9495am	13625as	13760na
1200-1300 as	USA, CS Monitor Boston MA	15665eu			
1200-1300	USA, KCBI Dallas TX	9815am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, VOA Washington DC	6110as	9760au	11715as	15155au
		15425as			
1200-1300	USA, WHRI Noblesville IN	7315na	9850sa	11790sa	
1200-1300	USA, WJCR Upton KY	7490na	13595na		
1200-1300	USA, WWCR Nashville TN	5935va	15685va		
1200-1300	USA, WYFR Okeechobee FL	5950am	6015am	7355am	11830am
		17760am			
1200-1230	Uzbekistan, R Tashkent	5945as	9540as	15470as	17745as
1205-1300 ocasnal	New Zealand, R NZ Intl	9510as			
1210-1300	Finland, Radio	15400na	21550na		
1215-1300	Egypt, Radio Cairo	17595as			
1215-1300	South Korea, Radio Korea	9750am			
1226-1300	Ghana, GBC Radio 2	7295do			
1230-1300	Australia, Radio	5995pa	6020pa	7150pa	7240pa
		9580pa	9770pa	13755pa	21725pa
1230-1300	Austria, R Austria Intl	6155eu	13730na	15450va	17730as
1230-1300	Bangladesh, Radio	15200eu	17750eu		
1230-1255	France, Radio France Intl	9805eu	11670eu	15155eu	15195eu
		15365na	21645na		
1230-1235	India, All India Radio	3925do	4860do	11770as	15145as
		17850as			
1230-1300	Netherlands, Radio	5955eu			
1230-1300	Sri Lanka, SLBC Colombo	6075as	9720as		
1230-1300	United Kingdom, BBC London	5965ca	6045eu	6195ca	9410eu
		9560eu	9600eu	9635eu	9740na
		11680eu	11710na	11845na	12095eu
		15115eu	15220na	21715eu	
1230-1300	Vietnam, Voice of	9840as	12020as	15010as	
1230-1300	Yugoslavia, Radio	17740na	21605na		
1235-1245	Greece, Voice of	15635na	15650na	17515na	

SELECTED PROGRAMS

Sundays

- 1201 BBC: Play Of The Week. See S 0101.
 1230 Radio Korea: Echoes Of Korean Music. See S 0615.
 1250 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

- 1200 Radio For Peace Int'l: Living Enrichment Center. See M 0400.
 1209 BBC: Words Of Faith. Speakers from various faiths discuss scripture and their beliefs.
 1215 BBC: Quiz General musical knowledge is tested in "Ned Sherrin's Counterpoint" (through May 24th).
 1230 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0430.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 Radio Korea: Seoul Calling. See M 0620.
 1245 BBC: Sports Roundup. See S 0315.
 1255 Radio Korea: Tales From Korea's Past. See M 0640.

Tuesdays

- 1200 Radio For Peace Int'l: Alternative Radio. See T 0400.
 1209 BBC: Words Of Faith. See M 1209.

- 1215 BBC: Multitrack 1. See M 2330.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 Radio Korea: Seoul Calling. See M 0620.
 1245 BBC: Sports Roundup. See S 0315.
 1255 Radio Korea: Korean Cultural Variety. See T 0640.

Wednesdays

- 1200 Radio For Peace Int'l: Seeing Beyond. See W 0400.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: New Ideas. See M 1615.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 BBC: Talks. See M 1635.
 1235 Radio Korea: Seoul Calling. See M 0620.
 1245 BBC: Sports Roundup. See S 0315.
 1255 Radio Korea: Pulse Of Korea. See W 0640.

Thursdays

- 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 2. See W 2330.
 1230 Radio For Peace Int'l: Voices Of Our World. See T 0330.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 Radio Korea: Seoul Calling. See M 0620.
 1245 BBC: Sports Roundup. See S 0315.

- 1255 Radio Korea: Forward To Reunification. See H 0640.

Fridays

- 1200 Radio For Peace Int'l: UNESCO. See M 2330.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Feature. This month: "Tea" (2nd); "The Poisoned Leaf" (9th); "Going To The Movies" (16th); "Fame" (23rd, 30th).
 1230 Radio For Peace Int'l: WINGS. See W 0530.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 Radio Korea: Let's Sing Together. See F 0620.
 1245 BBC: Sports Roundup. See S 0315.
 1255 Radio Korea: Let's Learn Korean! See F 0640.

Saturdays

- 1200 Radio For Peace Int'l: World Of Radio. See S 0200.
 1209 BBC: Words Of Faith. See M 1209.
 1215 BBC: Multitrack 3. See F 2330.
 1230 Radio For Peace Int'l: RFPI's Mailbag. See S 0330.
 1230 Radio Korea: News Commentary. See S 0045.
 1235 Radio Korea: Sites And Sounds. See S 0050.
 1245 BBC: Sports Roundup. See S 0315.
 1250 Radio Korea: From Us To You. See S 0105.

1300 UTC

[9:00 AM EDT/6:00 AM PDT]

FREQUENCIES

1300-1400	Australia, ABC Alice Sprg	2310do			
1300-1400	Australia, ABC Brisbane	4920do			
1300-1400	Australia, ABC Katherine	2485do			
1300-1400	Australia, ABC Perth	9610do			
1300-1400	Australia, ABC Tennant Cr	2325do			
1300-1400	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855as	13755as		
1300-1330 mtwtf	Belgium, R Vlaanderen	17550as	21810eu		
1300-1320	Brazil, Radiobras	15445am			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400 mtwtf	Canada, RCI Montreal	9635na	11855na	17820am	
1300-1400	China, China Radio Intl	7405na	9715as	11660va	15440pa
1300-1400	Costa Rica, RFPI Santa Ana	7375am	13630na	15030na	
1300-1400	Ecuador, HCJB Quito	11925am	15115am	17490va	17890am
		21455am			
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Finland, Radio	15400na	21550na		
1300-1330	Finland, Radio	15400na	21550na		
1300-1325	Kenya, Voice of	4935do			
1300-1400	Lebanon, Wings of Hope	11530me			
1300-1400	Malaysia, RTM Radio 4	7295do			
1300-1325	Netherlands, Radio	5955eu			
1300-1400 ocasnl	New Zealand, R NZ Intl	9510as			
1300-1400	Nigeria, Radio	4990do	7285do		
1300-1400	Nigeria, Voice of	7255af			
1300-1350	North Korea, R Pyongyang	9345eu	9640as	13760am	15230as
1300-1330 as	Norway, Radio Norway Intl	9590eu	25730af		
1300-1400	Palau, KHBN	9830va			
1300-1400	Philippines, FEBC Manila	11995as			
1300-1355	Poland, Polish R Warsaw	6135eu	7145eu	9525eu	11815eu
1300-1400	Romania, R Romania Intl	11940eu	15365eu	17720eu	17850eu
1300-1400	Russia, Radio Moscow	7330va	7370va	7380va	9705va
		9715va	9755va	9890va	11710va
		15480va	15510va	15520va	15540va
		15550va	17570va	17600va	17735va
		17840va	17860va	21610va	21785va
1300-1400 vl	S Africa, Radio Oranje	9630do			

1300-1400	Singapore, SBC1	5010do	5052do	11940do	
1300-1315	South Korea, Radio Korea	9750na			
1300-1400	Sri Lanka, SLBC Colombo	6075as	9720as		
1300-1330	Switzerland, Swiss R Intl	7480as	11690as	13635as	15505as
		17670as	21820as		
1300-1330	United Kingdom, BBC London	5965am	6190eu	6195eu	7180as
		9410eu	9515eu	9515na	9740eu
		9750eu	15220am	15575va	17640va
		17705va	17790va	21470va	
1300-1400	USA, CSMonitor Boston MA	9425au	9495am	13625as	13760na
1300-1400 as	USA, CSMonitor Boston MA	15665eu			
1300-1400	USA, KCBI Dallas TX	9815am			
1300-1400	USA, KNLS Anchor Point AK	9615as			
1300-1400	USA, KTNB Salt Lk City UT	7510am			
1300-1330	USA, VOA Washington DC	6110as	9760au	11715as	15155au
		15425au			
1300-1400	USA, WHRI Noblesville IN	9465na	11790na		
1300-1400	USA, WJCR Upton KY	7490na	13595na		
1300-1400	USA, WWCN Nashville TN	5935va	15685va		
1300-1400	USA, WYFR Okeechobee FL	5950am	9705na	11830am	13695na
		17760am			
1303-1310	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
1320-1400	Jordan, Radio	9560eu			
1325-1400 mtwhf	Kenya, Voice of	4935do			
1330-1400	Austria, R Austria Intl	15450as	17730as		
1330-1357	Canada, RCI Montreal	6150as	9535as		
1330-1400 mtwtf	Finland, Radio	15400na	21550na		
1330-1400	India, All India Radio	9665as	11760as	15120as	
1330-1400	Netherlands, Radio	13770as	17610as		
1330-1400	Sweden, Radio	15240as	21625pa		
1330-1400	Turkey, Voice of	9675as			
1330-1400	UAE, UAE Radio Dubai	13675eu	15320eu	15435as	21605as
1330-1400	United Kingdom, BBC London	5965am	6190na	6195am	7180af
		9410na	9515na	9740as	15070va
		15220na	15310va	15575me	21660af
1330-1400	USA, VOA Washington DC	6110as	9760as	15155au	15425au
1330-1400	Uzbekistan, R Tashkent	5945as	9540as	15470as	17745as
1330-1400	Vietnam, Voice of	9840as	12020as	15010as	
1345-1400	Vatican State, Vatican R	15090au	17525au	21515au	

SELECTED PROGRAMS

Sundays

- 1300 Radio For Peace Int'l: World Citizen's Hour. See S 0500.
 1305 Swiss Radio Int'l: Feature. See S 0605.

Mondays

- 1305 Swiss Radio Int'l: Dateline. See M 0605.
 1330 Radio For Peace Int'l: World Goodwill Forum. See M 0530.

Tuesdays

- 1300 Radio For Peace Int'l: United Nations. See M 0245.
 1305 Swiss Radio Int'l: Dateline. See M 0605.
 1315 Radio For Peace Int'l: RFPI Reports. See S 0230.
 1330 Radio For Peace Int'l: Peace Forum. See S 0300.

Wednesdays

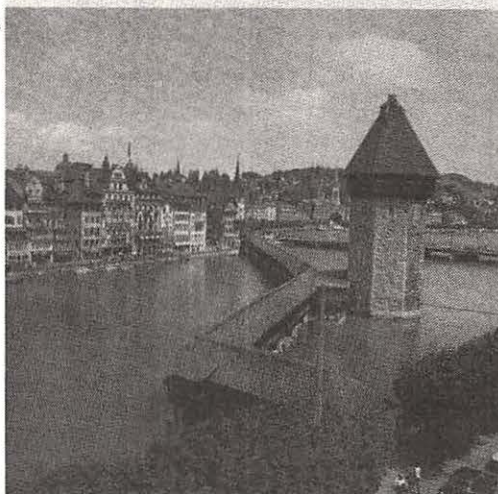
- 1300 Radio For Peace Int'l: UNESCO. See M 2330.
 1305 Swiss Radio Int'l: Dateline. See M 0605.
 1315 Radio For Peace Int'l: RFPI Reports. See S 0230.
 1330 Radio For Peace Int'l: WINGS. See W 0530.

Thursdays

- 1300 Radio For Peace Int'l: United Nations. See M 0245.
 1305 Swiss Radio Int'l: Dateline. See M 0605.
 1315 Radio For Peace Int'l: RFPI Reports. See S 0230.



Luzern - Kappelbrücke über der Reuss
 Lucerne - La Reuss enjambée par le pont de bois couvert
 Lucerna - Ponte di Kappel sulla Reuss
 Lucerna - The covered wooden bridge over the River Reuss
 Lucerna - El río Reuss y su famoso puente de madera
 Lucerna - A famoso ponte coberto sobre o Rio Reuss
 لوسرن - الجسر المشهور المغطى بالخشب على نهر الرويس



- 1330 Radio For Peace Int'l: Vietnam Veterans Radio Network. See S 0630.

Fridays

- 1300 Radio For Peace Int'l: Dialogue. See T 2330.
 1305 Swiss Radio Int'l: Dateline. See M 0605.
 1315 Radio For Peace Int'l: RFPI Reports. See S 0230.
 1330 Radio For Peace Int'l: Steppin' Out Of Babylon. See T 0300.

Saturdays

- 1300 Radio For Peace Int'l: United Nations. See M 0245.
 1305 Swiss Radio Int'l: Grapevine. See S 0005.
 1315 Radio For Peace Int'l: RFPI Reports. See S 0230.
 1318 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
 1330 Radio For Peace Int'l: Outlaw For Peace. See A 0530.

*This Swiss Radio International
 QSL was submitted by
 John Carson, Norman, OK.*

1400 UTC

[10:00 AM EDT/7:00 AM PDT]

FREQUENCIES

1400-1500	Australia, ABC Brisbane	4920do			
1400-1500	Australia, ABC Perth	6140do			
1400-1430	Australia, Radio	5995pa	7240pa	9580pa	11800pa
		11855pa	13755pa		
1400-1500	Australia, VLW6 Wanneroo	6140do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, RCI Montreal	11855am	11955am	17820am	
1400-1500	China, China Radio Intl	7405na	11815as	15165as	
1400-1500	Costa Rica, RFPI Santa Ana	7375na	13630na	15030am	
1400-1430	Ecuador, HCJB Quito	11925am	15115am	17890am	21455am
1400-1500	France, Radio France Intl	11910as	15405as	17650me	
1400-1500	Ghana, GBC Radio 1	4915do			
1400-1500	Ghana, GBC Radio 2	7295do			
1400-1500	India, All India Radio	9665as	11760as	15120as	
1400-1500	Iraq, Radio Iraq Intl	13680as			
1400-1425 smtwh	Israel, Kol Israel	11587am	11603na	15640na	15650as
		17575eu	17590eu		
1400-1500 irreg	Italy, IRRS Milan	7125eu			
1400-1500	Japan, Radio	9535va	11815as		
1400-1500	Jordan, Radio	9560eu			
1400-1500 mtwhf	Kenya, Voice of	4935do			
1400-1500	Lebanon, King of Hope	6280me			
1400-1500	Malaysia, RTM Radio 4	4950do	7295do		
1400-1500	Malta, V of Mediterranean	11925eu			
1400-1425	Netherlands, Radio	13770as	17610as		
1400-1500 ocasnal	New Zealand, R NZ Intl	9510as			
1400-1500	Nigeria, Voice of	7255af			
1400-1500	Philippines, FEBC Manila	11995as			
1400-1500	Russia, Radio Moscow	6065as	7135va	7170as	7260as
		7330as	7345as	7370va	7380as
		9715va	9755na	9855va	9890va
		11675va	11710va	11980va	15480va
		15550va	17730va	21610va	21755va
		21785va			
1400-1500 vl	S Africa, Radio Oranje	9630do			
1400-1500	Singapore, SBC1	5010do	5052do	11940do	
1400-1500	South Korea, Radio Korea	9570as			
1400-1500	Sri Lanka, SLBC Colombo	6075as	9720as		
1400-1430	United Kingdom, BBC London	6195as	7180as	9515na	9515na
		9660eu	9740as	9750eu	11820as
		11860af	15070eu	15260na	15575va
		21490am	21660af		
1400-1500	USA, CSMonitor Boston MA	9530as	13625as	13760am	15665eu
		17510eu	17555am		
1400-1500 sa	USA, CSMonitor Boston MA	13710na			
1400-1500	USA, KCBI Dallas TX	15375va			
1400-1500	USA, KTNB Salt Lk City UT	7510na			
1400-1500	USA, VOA Washington DC	6110as	9645au	9760as	15160au
		15425au			
1400-1500	USA, WHRI Noblesville IN	9465na	15105na		
1400-1500	USA, WJCR Upton KY	7490na	13595na		
1400-1500	USA, WWCR Nashville TN	13845na	15685va		
1400-1500	USA, WYFR Okeechobee FL	6015am	9705na	11550as	11830am
		17760am			
1400-1415	Vatican State, Vatican R	15090au	17525au	21515au	
1415-1500	Bhutan, BC Service	5025do			
1415-1425	Nepal, Radio	3230do	5005do	7165do	
1430-1500	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	9770pa	11800pa
		11855pa	13755pa		
1430-1500	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1430-1435	India, All India Radio	7290do	9950do	10330do	
1430-1500	Myanmar, VO Myanmar	5990do			
1430-1500	Netherlands, Radio	9895as	13770as	15150as	17610as
1430-1500	United Kingdom, BBC London	6195as	7180as	9515na	9660eu
		9740as	9750eu	11820as	12095eu
		15070va	15260na	15575me	17640af
		17840af	21660af		
1430-1500 irreg	USA, KJES Mesquite NM	11715na			
1435-1440	India, All India Radio	7290do	10330do		
1445-1500 smwha	Mongolia, R Ulaanbaatar	7260as	13780as		

SELECTED PROGRAMS

Sundays

- 1400 Radio For Peace Int'l: From The Atom To The Universe. See S 0600.
- 1401 BBC: Feature. Malcolm Billings travels the globe in search of our "Heritage" (through May 2nd).
- 1415 Radio Korea: Echoes Of Korean Music. See S 0615.
- 1430 BBC: Anything Goes. Bob Holness presents a variety of musical requests.
- 1430 Radio For Peace Int'l: Vietnam Veterans Radio Network. See S 0630.
- 1435 Radio Korea: Shortwave Feedback. See S 0635.

Mondays

- 1400 BBC (as): Dateline East Asia. The political and economic affairs of the Pacific rim.
- 1405 BBC: Outlook. Conversation, controversy, and color from the UK and the world.
- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Seoul Calling. See M 0620.
- 1430 BBC: Off The Shelf. See M 0430.
- 1430 Radio For Peace Int'l: Changemakers. See M 0630.
- 1440 Radio Korea: Tales From Korea's Past. See M 0640.
- 1445 BBC: Musical Feature. See S 0445.

Tuesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 Radio For Peace Int'l: Peace Talks. See T 0600.
- 1405 BBC: Outlook. See M 1405.

- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Seoul Calling. See M 0620.
- 1430 BBC: Off The Shelf. See M 0430.
- 1430 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
- 1440 Radio Korea: Korean Cultural Variety. See T 0640.
- 1445 BBC: Musical Feature. See M 0145.

Wednesdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 Radio For Peace Int'l: Peace Forum. See S 0300.
- 1405 BBC: Outlook. See M 1405.
- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Seoul Calling. See M 0620.
- 1430 BBC: Off The Shelf. See M 0430.
- 1440 Radio Korea: Pulse Of Korea. See W 0640.
- 1445 BBC: Good Books. This month: de Laclos' "Les Liaisons Dangereuses" (7th); Austen's "Love And Friendship" (14th); Golding's "Rites Of Passage" (21st); Oz's "Black Box" (28th).

Thursdays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 Radio For Peace Int'l: Sound Currents Of The Earth. See M 0430.
- 1405 BBC: Outlook. See M 1405.
- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Seoul Calling. See M 0620.
- 1430 BBC: Off The Shelf. See M 0430.

- 1440 Radio Korea: Forward To Reunification. See H 0640.
- 1445 BBC: Recording Of The Week (except 29th: 1,000 Guineas Race, live horse-racing from Newmarket). See M 0615.

Fridays

- 1400 BBC (as): Dateline East Asia. See M 1400.
- 1400 Radio For Peace Int'l: Food For The Thoughtful. See M 0200.
- 1405 BBC: Outlook. See M 1405.
- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Let's Sing Together. See F 0620.
- 1430 BBC: Off The Shelf. See M 0430.
- 1430 Radio For Peace Int'l: The Practice Of Peacemaking. See F 0630.
- 1440 Radio Korea: Let's Learn Korean! See F 0640.
- 1445 BBC: Global Concerns. See F 0145.

Saturdays

- 1400 Radio For Peace Int'l: Peace Forum. See T 0200.
- 1401 BBC: Sportsworld. Extensive coverage and results of all the weekend's sports, including the Grand National horse race from Aintree (3rd).
- 1415 Radio Korea: News Commentary. See S 0045.
- 1420 Radio Korea: Sites And Sounds. See S 0050.
- 1430 Radio For Peace Int'l: Second Opinion. See H 0200.
- 1435 Radio Korea: From Us To You. See S 0105.

1500 UTC

[11:00 AM EDT/8:00 AM PDT]

FREQUENCIES

1500-1600	Australia, ABC Brisbane	6140do			
1500-1530	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	9770pa 1	1800pa
		11855pa	13755pa		
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, RCI Montreal	11955am	17820am		
1500-1600	China, China Radio Intl	11815as	15165as		
1500-1600	Costa Rica, RFPI Santa Ana	7375am	13630am	15030am	
1500-1600	Ecuador, HCJB Quito	11925am	17490va	17890am	21455am
1500-1550	Germany, Deutsche Welle	9735af	11965af	13610af	15145af
		17735af	17765af		
1500-1600	Guam, KTRW Agana	15610as			
1500-1600	Iraq, Radio Iraq Intl	13680as			
1500-1600	Japan, Radio	9535na	15355af		
1500-1600	Jordan, Radio	9560eu			
1500-1600	Malaysia, RTM Radio 4	4950do	7295do		
1500-1600	Malta, V of Mediterranean	11925eu			
1500-1515 smwha	Mongolia, R Ulaanbaatar	7260as	13780as		
1500-1600	Myanmar, VO Myanmar	5990do			
1500-1600	Netherlands, Radio	9895as	13770as	15150as	17610as
1500-1600	New Zealand, R NZ Intl	9510as			
1500-1600	Nigeria, Radio	4990do	7285do		
1500-1600	Nigeria, Voice of	7255af			
1500-1550	North Korea, R Pyongyang	9325eu	9640af	9977af	13785eu
1500-1600	Philippines, FEBC Manila	11995as			
1500-1600	Russia, Radio Moscow	6065na	7170na	7260na	7330va
		7345na	7370va	7380na	9745va
		9755na	9780va	9855va	9890va
		12065va	15210va	15465va	15480va
		15540va	15550va	21610va	21755va
1500-1600 vi	S Africa, Radio Oranje	9630do			
1500-1555	Seychelles, FEBA	9810as	11710as	15330as	

1500-1600	Singapore, SBC1	5010do	5052do	11940do	
1500-1600	Sri Lanka, SLBC Colombo	6075as	9720as		
1500-1530	Sudan, National BC Corp	9170af			
1500-1530	Sudan, R National Unity	9170do			
1500-1530	Switzerland, Swiss R Intl	13635af	15505af	17670af	21820me
1500-1530	United Kingdom, BBC London	6195as	7180as	9515na	9660as
		9740na	9750eu	11750af	12095eu
		15070va	15260na	15310va	15420va
		17790va	17840af	17860va	21470am
		21660af			
1500-1600	USA, CS Monitor Boston MA	9530as	13760pa	17510am	
1500-1600 sa	USA, CS Monitor Boston MA	13710na			
1500-1600	USA, KCBI Dallas TX	15375va			
1500-1600	USA, KTNB Salt Lk City UT	7510na			
1500-1600	USA, VOA Washington DC	6110as	7125as	9645as	9700eu
		9760as	15205me	15395as	
1500-1600	USA, WHRI Noblesville IN	9465sa	15105na		
1500-1600	USA, WJCR Upton KY	7490na	13595na		
1500-1600	USA, WWCR Nashville TN	13845na	15685va		
1500-1600	USA, WYFR Okeechobee FL	11830am	15215am	17760am	
1515-1530	Canada, RCI Montreal	9555am	11915am	11935am	15315am
		15325am	21545am		
1530-1600	Australia, Radio	5995pa	6060pa	7240pa	7260pa
		9560pa	9580pa	11800pa	11855pa
		13755pa			
1530-1600	Austria, R Austria Intl	6155eu	11780as	13730eu	21490va
1530-1540 mtwhfa	Greece, Voice of	15630na	15650na	17525na	
1530-1545	India, All India Radio	3945do	6140do	7290do	7412do
		9950do	10330do		
1530-1600 mtwhf	Portugal, Radio	21515me			
1530-1600	United Kingdom, BBC London	6195va	7180as	9515va	9740na
		9750na	11750as	12095eu	15070va
		15260as	15420va	17840na	17860va
		17880va	21660af		
1545-1600	Vatican State, Vatican R	15090au	17865as		

SELECTED PROGRAMS

Sundays

- 1500 BBC (af): Postmark Africa. See S 0335.
 1500 Radio For Peace Int'l: Red Cross Roads or The CFRU Series. The work of the Red Cross, or current-affairs issues from a student-radio viewpoint.
 1505 Swiss Radio Int'l: Feature. See S 0605.
 1515 BBC: Concert Hall. This month: Bach's "St. Matthew Passion" (4th); Zwilich's "Flute Concerto" (11th); Tchaikovsky's "Fifth Symphony" (18th); Wren's "Third String Quartet" (25th).
 1530 Radio For Peace Int'l: The World In Review. News from the United Nations and worldwide from the week just past.
 1545 Radio For Peace Int'l: RFPI Reports. See S 0230.

Mondays

- 1500 Radio For Peace Int'l: World Of Radio. See S 0200.
 1505 Swiss Radio Int'l: Dateline. See M 0605.
 1515 BBC (af): Focus On Africa. African politics, sports, economics, medicine, and media.
 1515 BBC: Feature/Drama. See M 0101.
 1530 BBC: Feature. See M 0115.
 1530 Radio For Peace Int'l: The World In Review. See S 1530.
 1545 Radio For Peace Int'l: RFPI Reports. See S 0230.

Tuesdays

- 1505 Swiss Radio Int'l: Dateline. See M 0605.
 1515 BBC (af): Focus On Africa. See M 1515.
 1515 BBC: A Jolly Good Show. Dave Lee Travis presents listener

rock music requests.

- 1530 Radio For Peace Int'l: UNESCO. See M 2330.
 1545 Radio For Peace Int'l: RFPI Reports. See S 0230.

Wednesdays

- 1505 Swiss Radio Int'l: Dateline. See M 0605.
 1515 BBC (af): Focus On Africa. See M 1515.
 1515 BBC: Talks. See M 0415.
 1530 BBC: Comedy/Quiz. This month, join Brian Sibley as he examines the history of conjuring in "It's Magic!" (except 28th: Two Cheers For April, a humorous look at the month just past).

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- 1530 Radio For Peace Int'l: Dialogue. See T 2330.
 1545 Radio For Peace Int'l: RFPI Reports. See S 0230.

Thursdays

- 1500 Radio For Peace Int'l: Common Ground. See W 2300.
 1505 Swiss Radio Int'l: Dateline. See M 0605.
 1515 BBC (af): Focus On Africa. See M 1515.
 1515 BBC: Classics With Kay. See S 2315.
 1530 Radio For Peace Int'l: Population Update or FAO. See W 2330.

Fridays

- 1500 Radio For Peace Int'l: Peace Forum. See S 0300.
 1505 Swiss Radio Int'l: Dateline. See M 0605.
 1515 BBC (af): Focus On Africa. See M 1515.
 1515 BBC: Music Review (except 9th: St. Matthew Passion). See H 2315.
 1530 Radio For Peace Int'l: United Nations. See M 0245.
 1545 Radio For Peace Int'l: RFPI Reports. See S 0230.

Saturdays

- 1500 BBC (af): Spice Taxi. See A 0630.
 1500 Radio For Peace Int'l: World Citizens Weekly Commentary. See F 1500.
 1505 Swiss Radio Int'l: Grapevine. See S 0005.
 1515 BBC: Sportsworld. See A 1401.
 1518 Swiss Radio Int'l: Swiss Shortwave Merry-Go-Round. See S 0018.
 1530 Radio For Peace Int'l: RFPI Reports. See S 0230.

1600 UTC

[12:00 PM EDT/9:00 AM PDT]

FREQUENCIES

1600-1630	Australia, Radio	5995pa	6060pa	7240pa	7260pa	1600-1700	Saudi Arabia, BSKSA	9705eu	9720eu		
		9560pa	9580pa	11800pa	11855pa	1600-1605	Singapore, SBC1	5010do	5052do	11940do	
		11880pa	13755pa			1600-1700	South Korea, Radio Korea	5975om	9870af		
1600-1700	Canada, CFCX Montreal	6005do				1600-1700	Sri Lanka, SLBC Colombo	6075as	9720as		
1600-1700	Canada, CFRX Toronto	6070do				1600-1700	Swaziland, TWR	9500af			
1600-1700	Canada, CFVP Calgary	6030do				1600-1630	Sweden, Radio	17870na	21500me		
1600-1700	Canada, CHNX Halifax	6130do				1600-1645	UAE, UAE Radio Dubai	11795af	13675eu	15320eu	21605eu
1600-1700	Canada, CKZU Vancouver	6160do				1600-1630	United Kingdom, BBC London	6195va	7180va	7215na	9410va
1600-1700	China, China Radio Intl	11575af	15110af	15130af				9515na	9740me	12095eu	15070eu
1600-1700	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na				15260na	15310va	15400af	17705va
1600-1700	Ecuador, HCJB Quito	17790me	21455am	21480me				17840af	17860va	17880af	21470am
1600-1700	France, Radio France Intl	11705af	12015af	15530me	17620af			21660af			
		17795af	17850af			1600-1700	USA, CSMonitor Boston MA	11580as	13625as	17510n	a 21640af
1600-1630	Georgia, Georgian Radio	9565.3				1600-1700 sa	USA, CSMonitor Boston MA	13710na	17555am		
1600-1650	Germany, Deutsche Welle	7225as	7305as	9585as	11785as	1600-1700	USA, KCBI Dallas TX	15375va			
		15105as	15595as			1600-1700	USA, KTNB Salt Lk City UT	15590am			
1600-1700	Ghana, GBC Radio 1	4915do				1600-1700	USA, VOA Washington DC	11920af	11995af	13710af	15205me
1600-1700	Ghana, GBC Radio 2	7295do						15255af	15320af	15445af	19261af
1600-1700	Guam, KSDA Agana	11980as				1600-1700	USA, WHRI Noblesville IN	9465am	15105am		
1600-1645	Guam, KTWB Agana	15610as				1600-1700	USA, WJCR Upton KY	7490na	13595na		
1600-1700 unconfm	Iraq, Radio Iraq Intl	13680as				1600-1700	USA, WWCN Nashville TN	13845am	15685va		
1600-1610	Lesotho, Radio Lesotho	4800do				1600-1700	USA, WYFR Okeechobee FL	11830am	15215na	15355am	17760eu
1600-1625	Netherlands, Radio	9895as	13770as	15150as	17610as			21525af	21615af		
1600-1648 occasnal	New Zealand, R NZ Intl	9510as				1600-1640	Vatican State, Vatican R	15090au	17865au		
1600-1700	Nigeria, Radio	4990do				1600-1630	Vietnam, Voice of	12020eu	15010eu		
1600-1700	Nigeria, Voice of	7255af				1630-1700	Australia, Radio	5995pa	6060pa	6080pa	7240pa
1600-1630 as	Norway, Radio Norway Intl	11875as	15230af					7260pa	9560pa	9580pa	11880pa
1600-1630	Pakistan, Radio	11570me	13685af	15555af	17558af			11910pa	13755pa		
		21495af				1630-1657	Canada, RCI Montreal	7150as	9555as		
1600-1655	Poland, Polish R Warsaw	7285eu	9525eu	11840eu		1630-1700	Egypt, Radio Cairo	15255af			
1600-1630	Russia, AWR Russia	15125as				1630-1700 mtwhf	Portugal, Radio	21515me			
1600-1700	Russia, Radio Moscow	6065va	7170va	7250na	7260na	1630-1700	United Kingdom, BBC London	6195va	9515na	9630va	9740me
		7345va	7370as	9540va	9590va			11940af	12095eu	15070eu	15260na
		9660va	9705va	9715va	9755na			15310va	15420va	17880af	21470af
		9860va	9890va	9895va	11655va			21660af			
		11840va	15465va	15480va	15540va	1630-1700	USA, VOA Washington DC	6180eu	9700eu	9760me	11855me
		15550va	21755va					15205me	15245me		
1600-1700	S Africa, Channel Africa	15430af				1645-1700 s	Guam, KTWB Agana	15610as			
1600-1640 vl	S Africa, Radio Oranje	9630do				1650-1700 smtwhf	New Zealand, R NZ Intl	9675pa			

SELECTED PROGRAMS

Sundays

- 1600 KSDA, Guam: AWR Magazine. See S 0200.
 1615 BBC: Feature (except 4th: Sportsworld, the English FA Cup soccer semifinals). See S 0230.
 1615 KSDA, Guam: DX Asiawaves. See S 0215.
 1615 Radio Korea: Echoes Of Korean Music. See S 0615.
 1630 KSDA, Guam: Power To Cope. Advice for coping with life's problems.
 1635 Radio Korea: Shortwave Feedback. See S 0635.
 1645 BBC: Letter From America. See S 0615.

Mondays

- 1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1615 BBC: New Ideas. A look at the latest technology, innovations, and new products.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Radio Korea: News Commentary. See S 0045.
 1620 Radio Korea: Seoul Calling. See M 0620.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1635 BBC: Talks. This month, famous people who aren't famous anymore are profiled in another series of "Whatever Happened To...?".
 1640 Radio Korea: Tales From Korea's Past. See M 0640.
 1645 BBC: The World Today. A look at a topical aspect of the international scene.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Tuesdays

- 1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1615 BBC: Megamix. See T 1130.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Radio Korea: News Commentary. See S 0045.
 1620 Radio Korea: Seoul Calling. See M 0620.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 Radio Korea: Korean Cultural Variety. See T 0640.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Wednesdays

- 1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1615 BBC: Rock/Pop Music. See T 0630.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Radio Korea: News Commentary. See S 0045.
 1620 Radio Korea: Seoul Calling. See M 0620.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 Radio Korea: Pulse Of Korea. See W 0640.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Thursdays

- 1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1615 BBC: Network UK. Issues and events affecting people across the UK.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Radio Korea: News Commentary. See S 0045.

- 1620 Radio Korea: Seoul Calling. See M 0620.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 Radio Korea: Forward To Reunification. See H 0640.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Fridays

- 1600 KSDA, Guam: Music Scrapbook. See S 2300.
 1615 BBC: Science In Action. The latest in science and technology.
 1615 KSDA, Guam: Bible In Living Sound. See S 2315.
 1615 Radio Korea: News Commentary. See S 0045.
 1620 Radio Korea: Let's Sing Together. See F 0620.
 1630 KSDA, Guam: Greatest Story Ever Told. See M 0130.
 1640 Radio Korea: Let's Learn Korean! See F 0640.
 1645 BBC: The World Today. See M 1645.
 1645 KSDA, Guam: Voice Of Prophecy. See S 0130.

Saturdays

- 1600 KSDA, Guam: Micronesian Snapshots. The news, music, and culture of Micronesia.
 1615 BBC: Sportsworld. See A 1401.
 1615 KSDA, Guam: DX Asiawaves. See S 0215.
 1615 Radio Korea: News Commentary. See S 0045.
 1620 Radio Korea: Sites And Sounds. See S 0050.
 1630 KSDA, Guam: Digging Up The Past. See S 0230.
 1635 Radio Korea: From Us To You. See S 0105.
 1645 KSDA, Guam: Probe. See S 0245.

1700 UTC

[1:00 PM EDT/10:00 AM PDT]

1700-1800	Algeria, Radio Algiers	9535me	17745af		
1700-1800	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240pa	7260pa	9580pa	11880pa
		11910pa			
1700-1800	Azerbaijan, R Dada Gorud	9840as			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1730 mtwhf	Canada, RCI Montreal	5995eu	7235eu	13650eu	15325eu
		17820eu	21545eu		
1700-1800	China, China Radio Intl	9570as	11575as	15345as	
1700-1800	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na	
1700-1800	Ecuador, HCJB Quito	15270me	17790me	21455me	21480na
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Ghana, GBC Radio 1	4915do			
1700-1800 as	Guam, KSDA Agana	13720as			
1700-1800 irreg	Italy, IRRS Milan	7125eu			
1700-1800	Japan, Radio	7140au	9535na	11815as	17775ma
1700-1800	Jordan, R Jordan, Amman	9560eu			
1700-1800 smtwhf	New Zealand, R NZ Intl	9675pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9977af	11705eu
1700-1730 as	Norway, Radio Norway Intl	9655eu			
1700-1800	Pakistan, Radio	9420eu	11570eu		
1700-1800	Russia, Radio Moscow	7170as	7250na	7260as	7345as
		7370as	9540na	9685va	9705va
		9755na	9860va	9890va	12060va
1700-1800	S Africa, Channel Africa	11900af	15430af		
1700-1800	Saudi Arabia, BSKSA	9705eu	9720eu		
1700-1730	Sri Lanka, SLBC Colombo	6075as	9720as		
1700-1730	Swaziland, TWR	9520af			
1700-1730	Switzerland, Swiss R Intl	3985eu	6165eu	9535eu	
1700-1715	Switzerland, Swiss R Intl	9885af	13635af	15430af	17635af
1700-1730	United Kingdom, BBC London	5975na	6190na	9410va	9515na
		9740va	12095eu	15070eu	15260na
		15310va	15400af	15420af	17880af
		21660af			
1700-1800	USA, CSMonitor Boston MA	11580as	13625as	17510na	21640af
1700-1800 sa	USA, CSMonitor Boston MA	13710na	17555am		
1700-1800	USA, KCBI Dallas TX	15375va			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, VOA Washington DC	6040me	9700va	9760me	11920af
		11995af	13710af	15205me	15320af
		15445af	19261am		
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na	13595na		
1700-1800 smtwhf	USA, WMLK Bethel PA	9465eu			
1700-1800	USA, WWCR Nashville TN	13845va	15685va		
1700-1800	USA, WYFR Okeechobee FL	21500va			
1715-1730	Vatican State, Vatican R	6245eu	7250af	9645me	
1730-1800	Bulgaria, Radio Sofia	6235eu	9560eu	9700na	11720na
1730-1800	Netherlands, Radio	6020af	9605af	21515af	21590af
1730-1800	Romania, R Romania Intl	15340af	15365af	17720af	17745af
1730-1800	Swaziland, TWR	11740af			
1730-1800	United Kingdom, BBC London	3955va	5975va	6010va	9515na
		9740me	12095eu	15070eu	15260na
		15310va	15400va	15420af	17780va
		21660af			
1730-1800	Vatican State, Vatican R	11625af	15090af	17730af	
1745-1800	India, All India Radio	7412me	9950eu	11620eu	11860af

1800 UTC

[2:00 PM EDT/11:00 AM PDT]

1800-1900 twhts	Argentina, RAE Buenos Aires	15345eu			
1800-1900	Australia, Radio	5880pa	5995pa	6060pa	6080pa
		7240MS	7260pa	9580pa	11880pa
		11910pa			
1800-1830	Belgium, R Vlaanderen	5900af	15440eu		
1800-1900	Brazil, Radiobras	15265eu			
1800-1900	Bulgaria, Radio Sofia	15330na			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1830	Canada, RCI Montreal	13670af	15260af	17820af	
1800-1900	Costa Rica, RFPI Santa Ana	7375am	13630am	15030am	
1800-1827	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
1800-1900	Ecuador, HCJB Quito	17790eu			
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Ghana, GBC Radio 1	4915do			
1800-1900	Ghana, GBC Radio 2	7295do			
1800-1900 as	Guam, KSDA Agana	13720as			
1800-1900	India, All India Radio	7412me	9950me	11620eu	11860af
		11935af	15080as		
1800-1815	Israel, Kol Israel	7465na	11587eu	11675na	17575af
1800-1900 irreg	Italy, IRRS Milan	7125eu			
1800-1900	Kuwait, Radio	13620na			
1800-1825	Netherlands, Radio	6020af	9605af	21515af	21590af
1800-1850 smtwhf	New Zealand, R NZ Intl	9675pa			
1800-1855	Poland, Polish R Warsaw	7270eu	9525eu		
1800-1900	Russia, Radio Moscow	7260va	9685as	9755va	9785va
		9860va	9890va	11685au	11770va
		11840va	12050va	13670va	15425va
		15485va	17605va		
1800-1900	Saudi Arabia, BSKSA	9705eu	9720eu		
1800-1900	South Korea, Radio Korea	15575eu			
1800-1900	Sudan, National BC Corp	9170do			
1800-1900	Swaziland, TWR	3200af	9500af	11740af	
1800-1830	United Kingdom, BBC London	5975va	9410eu	11750af	15070eu
		15310va	15400af	15420af	17880af
		1535pa	13840na	15665eu	21640af
1800-1900 sa	USA, CSMonitor Boston MA	17555am			
1800-1900	USA, KCBI Dallas TX	15375va			
1800-1900 irreg	USA, KJES Mesquite NM	9510na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, VOA Washington DC	6040eu	9575af	9700eu	9760me
		11920af	11995af	13710af	15205me
		15410af	15445af	15580af	17650af
		17800af	19261va	21625af	
1800-1900	USA, WHRI Noblesville IN	13760na	17835sa		
1800-1900	USA, WINB Red Lion PA	15295eu			
1800-1900	USA, WJCR Upton KY	7490na	13595na		
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WWCR Nashville TN	13845am	15685na		
1800-1900	USA, WYFR Okeechobee FL	21500va			
1800-1830	Vietnam, Voice of	9840eu	12020eu	15010eu	
1815-1900	Bangladesh, Radio	9570me	12030eu		
1830-1900	Bulgaria, Radio Sofia	15330na			
1830-1900 as	Canada, RCI Montreal	13670af	15260af	17820af	
1830-1855	Finland, Radio	6120eu	9730eu	11755eu	
1830-1900	Netherlands, Radio	6020af	9605af	21515af	21590af
1830-1900	Sri Lanka, SLBC Colombo	9720eu	15120eu		
1830-1900	Sweden, Radio	6065eu	9655me	15270af	
1830-1900	United Kingdom, BBC London	3255va	6190va	6195va	9410eu
		9740va	12095eu	15070eu	15400af
		17880va			
1840-1850 mtwhfa	Greece, Voice of	15630af	17525af		
1850-1900 smtwhf	New Zealand, R NZ Intl	15120pa			

1900 UTC

[3:00 PM EDT/12:00 PM PDT]

1900-2000	Australia, Radio	5880pa 7240pa 11855pa	5995pa 7260pa 11880pa	6060pa 9580pa 11910pa	6080pa 11720pa
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-1930	Canada, RCI Montreal	13670af	15260af	17820af	
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, RFPI Santa Ana	7375am	13630am	15030am	
1900-2000	Ecuador, HCJB Quito	17490va	17790eu	21455eu	21480eu
1900-1950	Germany, Deutsche Welle	9765af	11765af	11785af	11905af
		13790af	15350af	17810af	
1900-1915 mtwhfa	Greece, Voice of	7450eu	9375eu		
1900-2000	India, All India Radio	7412me	9950eu	11620eu	11860af
1900-1930	Japan, Radio	9535na	11875au		
1900-2000	Kuwait, Radio	13620na			
1900-1930 s	Lebanon, King of Hope	6280me			
1900-2000 s	Morocco, RTV Marocaine	11920as			
1900-1925	Netherlands, Radio	6020af	9605af	21515af	21590af
1900-2000	New Zealand, R NZ Intl	15120pa			
1900-2000	Nigeria, Radio	3326do	4990do		
1900-2000	Nigeria, Voice of	7255af			
1900-1930 as	Norway, Radio Norway Intl	15220va	17730va		
1900-2000	Romania, R Romania Intl	6105eu	7195eu	7225eu	
1900-2000	Russia, Radio Moscow	7170va	7260va	9685va	9725va
		9785va	9860va	9890va	11770va
		11840va	11920va	12050va	13670va
		15425va	15485va	17605va	
1900-2000	Saudi Arabia, BSKSA	9705eu	9720eu		
1900-2000	Spain, Spanish Natl Radio	9675af	9685eu		
1900-2000	Sri Lanka, SLBC Colombo	7200eu	15120eu		
1900-2000	Swaziland, TWR	3200af	3240af	11740af	
1900-1930	United Kingdom, BBC London	6005va	7160va	9410eu	12095eu
		15070eu	15400af	17880va	
1900-2000	USA, CSMonitor Boston MA	9425pa	13840na	15665eu	21640af
1900-2000 sa	USA, CSMonitor Boston MA	17555am			
1900-2000	USA, KCBI Dallas TX	15375va			
1900-2000	USA, KTNB Salt Lk City UT	15590am			
1900-2000	USA, VOA Washington DC	3990af	9525as	9700eu	11870as
		11920af	11995af	13710af	15320af
		15410af	15495af	15580af	17800af
		19261am			
1900-2000	USA, WHRI Noblesville IN	13760na	17835na		
1900-2000	USA, WINB Red Lion PA	15295eu			
1900-2000	USA, WJCR Upton KY	7490na	13595na		
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WWCR Nashville TN	13845na	15685va		
1900-2000	USA, WYFR Okeechobee FL	15355eu	21615af		
1900-1930	Vietnam, Voice of	9840eu	12020eu	15010eu	
1910-1920	Botswana, Radio	3356af	4830af	7255af	
1930-2000	Austria, R Austria Intl	5945eu	6155eu	12010me	13730af
1930-1957	Czech Republic, R Prague	6055eu	7345eu		
1930-2000	Iran, VOIRI Tehran	9022va	15260va		
1930-2000 fa	Kazakhstan, R Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
1930-2000	Netherlands, Radio	17605af	21590af		
1930-2000	Poland, Polish R Warsaw	7145eu	9525eu		
1930-2000	Saipan, KFB	9465as			
1930-2000	United Kingdom, BBC London	6190va	6195va	7160va	9410va
		9630va	12095eu	15400af	17880af
1930-2000	Yugoslavia, Radio	6100eu	7200af		
1935-1955	Italy, RAI Rome	7275eu	9710eu	11800eu	
1940-2000 smwha	Mongolia, R Ulaanbaatar	11790eu	11850eu		
1945-2000	Bulgaria, Radio Sofia	6235eu			
1950-2000	Vatican State, Vatican R	5885eu	7250eu		

2000 UTC

[4:00 PM EDT/1:00 PM PDT]

2000-2030	Australia, Radio	5880pa 7240pa 11855pa	5995pa 7260pa 11880pa	6060pa 9580pa 11910pa	6080pa 11720as
2000-2015	Bulgaria, Radio Sofia	6235eu	9560na		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2015	Canada, RCI Montreal	11945eu	13650eu	13670eu	15325eu
		17820eu	17875eu		
2000-2100	China, China Radio Intl	6950eu	9440af	9920eu	11500eu
		11715af	15110af		
2000-2100	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2000-2100	Ghana, GBC Radio 1	4915do			
2000-2100	Ghana, GBC Radio 2	7295do			
2000-2100	Indonesia, V of, Jakarta	9675eu	11752eu		
2000-2030	Israel, Kol Israel	7465na	9435na	11587eu	11603am
		11675na	17575af		
2000-2010 mtwhf	Kenya, Voice of	4935do			
2000-2100	Kuwait, Radio	13620na			
2000-2100	Lebanon, King of Hope	6280me			
2000-2030	Lithuania, R Vilnius	9710eu			
2000-2010 smwha	Mongolia, R Ulaanbaatar	11850eu	12015eu		
2000-2025	Netherlands, Radio	17605af	21590af		
2000-2100	New Zealand, R NZ Intl	15120pa			
2000-2100	Nigeria, Radio	3326do	4990do		
2000-2030	Nigeria, Voice of	7255af			
2000-2050	North Korea, R Pyongyang	6576eu	9345eu	9640af	9977af
2000-2025	Poland, Polish R Warsaw	7145eu	9525eu		
2000-2030 mtwhf	Portugal, Radio	11740eu			
2000-2100	Russia, Radio Galaxy	11880eu			
2000-2100	Russia, Radio Moscow	4795va	4825va	7170va	7180va
		7205va	9685va	9725va	9785va
		9870va	9890va	15425na	17605na
		21480va			
2000-2100	Saudi Arabia, BSKSA	9705eu	9720eu		
2000-2045	Swaziland, TWR	3200af	3240af	11740af	
2000-2030	Switzerland, Swiss R Intl	9885af	12035af	13635af	15505af
2000-2030	United Kingdom, BBC London	9410eu	11945eu	11955va	12095eu
		13650eu	15070eu	15260sa	15325eu
		17875eu	17880af		
2000-2100	USA, CSMonitor Boston MA	7510eu	9455as	13625pa	13770am
		17510am	17555sa		
2000-2100	USA, KCBI Dallas TX	15375va			
2000-2100	USA, KTNB Salt Lk City UT	15590am			
2000-2100	USA, VOA Washington DC	6040eu	9700eu	9760eu	11710eu
		13710af	15160eu	15205eu	15410af
		15445af	15495af	15580af	17650af
		17800af	17895af	19261eu	21485af
		21625af			
2000-2100	USA, WHRI Noblesville IN	13760af	17835va		
2000-2100	USA, WJCR Upton KY	7490na	13595na		
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100	USA, WRNO New Orleans LA	15420na			
2000-2100	USA, WWCR Nashville TN	13845va	15685va		
2000-2100	USA, WYFR Okeechobee FL	15355eu	15355na	15566eu	15585eu
		17610na	17750af	21525eu	21615na
2000-2030	Vatican State, Vatican R	9645af	11625af	15090af	
2005-2100	Syria, Radio Damascus	12085na	15095na		
2010-2100 sa	Kenya, Voice of	4935do			
2025-2100	Belgium, R Vlaanderen	5910eu	9905eu		
2025-2045	Italy, RAI Rome	7235me	9575me	11800me	
2030-2100	Australia, Radio	5880pa 7260pa	5995pa 9580pa	6060pa 11720pa	7240pa 11855pa
		5995eu	7230eu	15140eu	17875eu
2030-2100	Canada, RCI Montreal	6145eu	9830eu	13830eu	
2030-2035	Croatia, Croatian Radio	15375af			
2030-2035	Egypt, Radio Cairo	5935do			
2030-2100	Latvia, Radio Riga	7315as	11685as	11915as	11985as
	Russia, R Aum Shinrikyo	11995as	13725as	15130as	15170as
		15190as	15525as	15560as	17655as
		17710as	17740as	17795as	
2030-2057	Slovakia, Bratislava	7345eu			
2030-2100	South Korea, Radio Korea	6480af	7550me	15575eu	
2030-2100	United Kingdom, BBC London	9410eu	12095eu	15260sa	15400af
		15495as	15580as		
2030-2100	USA, WHRI Noblesville IN	17835va			
2030-2100	Vietnam, Voice of	9840eu	12020eu	15010eu	

2100 UTC

[5:00 PM EDT/2:00 PM PDT]

2100-2130	Australia, Radio	5995pa	6060pa	9540pa	9580pa
		9645pa	11720pa	11855as	11880pa
		11910pa			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2130	China, China Radio Intl	9920eu	11715af	15110af	
2100-2200	China, China Radio Intl	6950eu	9920eu	11500eu	
2100-2200	Costa Rica, RFPI Santa Ana	7375na	13630na	15030na	
2100-2200	Cuba, Radio Havana Cuba	15165eu			
2100-2130	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2100-2130	Ecuador, HCJB Quito	21455va			
2100-2200	Egypt, Radio Cairo	15375af			
2100-2150	Germany, Deutsche Welle	6185as	9670as	9690as	9765as
		11785as			
2100-2200	Ghana, GBC Radio 1	4915do			
2100-2200	Ghana, GBC Radio 2	7295do			
2100-2200	Hungary, Radio Budapest	6110eu	9835eu	11910eu	
2100-2200	Japan, Radio	11815me	11840as	11925va	15195pa
		15280pa	15430eu	17810as	17890au
2100-2130	Lebanon, King of Hope	6280me			
2100-2139 smtwhf	New Zealand, R NZ Intl	15120pa			
2100-2200	Nigeria, Radio	3326do	4990do		
2100-2130 as	Norway, Radio Norway Intl	15180va			
2100-2130 mtwhf	Portugal, Radio	15250af			
2100-2200	Romania, R Romania Intl	5955eu	6105eu	7195eu	7225eu
		9690eu			
2100-2200	Russia, Radio Moscow	4795va	4825va	7115va	7150va
		7180va	7205va	9725va	9750va
		9785va	9860va	9870va	9890va
		12050na	13670va	15425na	17605na
		17665va	17690va	21480na	
2100-2130	South Korea, Radio Korea	6480af	7550me	15575eu	
2100-2200	Spain, Spanish Natl Radio	6130eu			
2100-2200	Sri Lanka, SLBC Colombo	15120as			
2100-2105	Syria, Radio Damascus	12085na	15095na		
2100-2200	Turkey, Voice of	9445eu			
2100-2200	Ukraine, R Ukraine Intl	5960eu	7250eu	7340eu	9600eu
		9635eu	9865eu	15135na	15570eu
2100-2130	United Kingdom, BBC London	6005va	6180va	7180as	9410eu
		9590na	15260sa	15340eu	15400af
2100-2200	USA, CSMonitor Boston MA	9455as	13625pa	13770na	15665eu
		17510na	17555sa		
2100-2200	USA, KCBI Dallas TX	15375va			
2100-2200	USA, KTNB Salt Lk City UT	15590na			
2100-2200	USA, VOA Washington DC	13710va	15290af	15410af	15495af
		15580af	17800af	19261af	21485af
2100-2200	USA, WHRI Noblesville IN	13760am	17835na		
2100-2200	USA, WINB Red Lion PA	15185eu			
2100-2200	USA, WJCR Upton KY	7490na	13595va		
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200	USA, WRNO New Orleans LA		15420na		
2100-2200	USA, WWCR Nashville TN	13845va	15685va		
2100-2200	USA, WYFR Okeechobee FL	7355eu	15566eu	17750af	21525eu
2100-2110	Vatican State, Vatican R	5885eu	7250eu		
2110-2200	Syria, Radio Damascus	12085na	15095na		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2200	Finland, Radio	9730eu	11740eu	11810eu	
2115-2130 mtwhf	United Kingdom, BBC Carib	15390ca	17715ca		
2130-2200	Australia, Radio	9540pa	9645pa	11720pa	11855pa
		11880pa	11910pa		
2130-2200	Austria, R Austria Intl	5945eu	6155eu	9870af	
2130-2200	Canada, RCI Montreal	11880af	15150af	17820af	
2130-2200	Ecuador, HCJB Quito	17490va	17790eu	21455va	21480eu
2130-2200	Kazakhstan, R Alma Ata	3955do	5035do	5260do	5960eu
		5970eu	7115eu	9505eu	9690eu
		11825eu	15215eu	15250eu	15270eu
		15285eu	15315eu	15360eu	15385eu
		17605eu	17730eu	17765eu	21490eu
2130-2200 smtwhf	Lebanon, King of Hope	6280me			
2130-2200	Sweden, Radio	6065eu	9655pa	11955as	
2130-2200	United Kingdom, BBC Flk Is	13660sa			
2130-2200	United Kingdom, BBC London	5975ca	6125eu	6180va	6195eu
		7125va	9410eu	9590na	15260sa
		15340va	15400va		

2200 UTC

[6:00 PM EDT/3:00 PM PDT]

2200-2230	Albania, R Tirana Intl	9760eu	11825eu		
2200-2230	Australia, Radio	9540as	9645pa	11720pa	11855as
		11880pa	15320pa	15365as	17795pa
			11720na		
2200-2215	Bulgaria, Radio Sofia	9700na			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2300	Canada, RCI Montreal	5995eu	9760eu	11945eu	
2200-2230	Canada, RCI Montreal	7180eu	11705as	13650eu	
2200-2230	China, China Radio Intl	3985eu	7170eu		
2200-2300	Costa Rica, RFPI Santa Ana	13630ca	15030ca		
2200-2300	Cuba, Radio Havana Cuba	6180va			
2200-2230	Czech Republic, R Prague	5960eu	6055eu	7345eu	9605eu
2200-2300	Ecuador, HCJB Quito	17790eu	21455am	21480eu	
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300 sa	Eq Guinea, R Africa	7190af			
2200-2245	Finland, Radio	9730eu	11740eu	11810eu	
2200-2300	Ghana, GBC Radio 1	4915do			
2200-2300	Ghana, GBC Radio 2	7295do			
2200-2230	India, All India Radio	7412eu	9910eu	9950eu	11620eu
		11715eu	15265eu		
2200-2300 unconfm	Iraq, Radio Iraq Intl	15210eu			
2200-2225	Italy, RAI Rome	5990as	9710as	11800as	
2200-2300 smtwha	Malaysia, RTM Radio 4	7295do			
2200-2300	New Zealand, R NZ Intl	17770pa			
2200-2300	Nigeria, Radio	3326do	4990do		
2200-2300	Russia, Radio Moscow	7115va	7170va	7180va	7300va
		9520va	9685va	9715va	9725va
		9735va	9750va	9785va	9795va
		9860va	9870va	9890va	12050va
		15425na	17570va	17605va	17655as
		17690va	21480na		
2200-2300	Sierra Leone, SLBS	3316do			
2200-2300	Singapore, SBC1	5010do	5052do	11940do	
2200-2230	Sweden, Radio	6065va	9655va	11995as	
2200-2230	Switzerland, Swiss R Intl	9810sa	9885sa	12035sa	15570sa
2200-2210	Syria, Radio Damascus	12085na	15095na		
2200-2300	Taiwan, VO Free China	9850eu	11915eu		
2200-2300	UAE, Radio Abu Dhabi	9605na	11710na	11815na	
2200-2300	Ukraine, R Ukraine Intl	4795eu	6010eu	6020eu	7195eu
		7240eu	9710eu		
2200-2300	United Kingdom, BBC London	5975na	6195as	7325am	9410va
		9590na	9915eu	11750sa	15260sa
2200-2300	USA, CSMonitor Boston MA	15340af	15400af	17325am	17830as
		7510va	9465na	13625as	15405as
		15665eu	17555am		
2200-2300	USA, KCBI Dallas TX	15725va			
2200-2300	USA, KTNB Salt Lk City UT	15590am			
2200-2230	USA, VOA Washington DC	6030sa	7120as	9770as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2300	USA, VOA Washington DC	7120as	9770as	11760as	15185au
		15290au	15305au	17735au	17820au
2200-2300	USA, WHRI Noblesville IN	13760na			
2200-2245	USA, WINB Red Lion PA	15185eu			
2200-2300	USA, WJCR Upton KY	7490na	13595na		
2200-2300	USA, WRNO New Orleans LA		15420na		
2200-2300	USA, WWCR Nashville TN	13845na	15685na		
2200-2300	USA, WYFR Okeechobee FL	17610na	17750eu	21525eu	
2200-2230 s	USA, KGEI San Francisco CA	15280sa			
2200-2229	Yugoslavia, Radio	6100eu	7200eu	9505na	
2203-2209	Croatia, Croatian Radio	6145eu	9830eu	13830eu	
2230-2300	Australia, Radio	9645pa	11720pa	11855pa	11880pa
		15320pa	15365pa	17795pa	
2230-2300 mtwhf	Congo, RTV Congoaise	4765do			
2230-2300	Israel, Kol Israel	7465eu	9435na	11587na	11603eu
		11675eu	17575eu		
2230-2300	Lithuania, Radio Vilnius	9675eu	9710eu		
2230-2300	USA, VOA Washington DC	9530eu	11905me	11960me	17885me
2240-2250 smtwhf	Greece, Voice of	11645au			
2245-2300	Armenia, Radio Yerevan	7440eu	11980eu	12060eu	
2245-2300	India, All India Radio	9910as	11745as	15110as	15145as
		17830as			
2245-2300	USA, WINB Red Lion PA	15145eu			
2245-2300	Vatican State, Vatican R	9600au	11830au	15090au	

2300 UTC

[7:00 PM EDT/4:00 PM PDT]

FREQUENCIES

2300-2330	Australia, Radio	11855va	15320pa	15365pa
2300-0000	Bulgaria, R Sofia	9700na	11720na	
2300-2400	Canada, CBC Northern Svc	9625do		
2300-2400	Canada, CFCX Montreal	6005do		
2300-2400	Canada, CFRX Toronto	6070do		
2300-2400	Canada, CFVP Calgary	6030do		
2300-2400	Canada, CHNX Halifax	6130do		
2300-2400	Canada, CKZU Vancouver	6160do		
2300-2330 as	Canada, RCI Montreal	11940sa	15235sa	
2300-2400	Costa Rica, AWR Alajuela	9725ca	11870ca	
2300-2400	Costa Rica, RFPI Santa Ana	7375na	7385na	13630na 15030na
2300-2400	Ecuador, HCJB Quito	17790eu	21455am	21480eu
2300-2305	Ghana, GBC Radio 1	4915do		
2300-2305	Ghana, GBC Radio 2	7295do		
2300-2400	Guam, KSDA Agana	15610as		
2300-2400	India, All India Radio	9910as	11715as	11745as 15110as
		15145as	17830as	
2300-2400	Iraq, Radio Iraq Intl	15210eu		
2300-2400	Japan, Radio	6050eu	6125eu	11815as 15195as
		15430as	17810eu	
2300-2400 smtwha	Malaysia, RTM Radio 4	7295do		
2300-2400	New Zealand, R NZ Intl	17770pa		
2300-2350	North Korea, R Pyongyang	11700am	13650am	
2300-2330 as	Norway, Radio Norway Intl	11795am		
2300-2400	Russia, Radio Moscow	4795va	4825va	4860va 7115va
		7150va	7170va	7180va 7300va
		9520va	9685va	9725va 9750va
		9660va	9870va	9890va 12050na
		15425na	17655na	21480na 21690as
2300-2400 vl	S Africa, Radio Orion	4810do		
2300-2310	Sierra Leone, SLBS	3316do		
2300-2400	Singapore, SBC1	5010do	5052do	11940do
2300-2400	Thailand, Radio	9655as	11905as	
2300-2350	Turkey, Voice of	7185me	9445na	11895eu
2300-2400	UAE, Radio Abu Dhabi	9605na	11710na	11815na

2300-2330	United Kingdom, BBC London	5975na	6175na	6195as	7180as
		7325as	9410va	9590va	11740sa
		11750af	11955af	15260sa	15400va
2300-2400	USA, CSMonitor Boston MA	7510af	9465na	13625as	13770na
		15405af	15665eu	17555af	
2300-2400	USA, KCBI Dallas TX	15725va			
2300-2400	USA, KTN Salt Lk City UT	15590na			
2300-2400	USA, KVOH Los Angeles CA	9725am			
2300-2400	USA, VOA Washington DC	7120as	7140va	9530me	9770as
		11760au	11905me	11960eu	15185au
		15290au	15305as	17735as	17820as
		17885me			
2300-2315 irreg	USA, WEWN Birmingham AL	7540na			
2300-2400	USA, WHRI Noblesville IN	13760sa			
2300-2400	USA, WINB Red Lion PA	15145eu			
2300-2400	USA, WJCR Upton KY	7490na	13595na		
2300-2400	USA, WRNO New Orleans LA	7355na			
2300-2400	USA, WWCR Nashville TN	13845na			
2300-2400	Australia, Radio	11720va	11855pa	11880pa	15240pa
		15320pa	15365pa	17795pa	21740pa
2330-2400	Austria, R Austria Intl	9870sa			
2330-0000	Belgium, R Vlaanderen	9930na	13655sa		
2330-2400 as	Canada, RCI Montreal	11940sa	15235sa		
2330-2400 a	Colombia, Radio Nacional	11822.5	17865am		
2330-2400	Netherlands, Radio	6020na	6165na		
2330-2400	Palau, KHBN	9830va			
2330-2400 m	Sri Lanka, SLBC Colombo	15425am			
2330-2400	Sweden, Radio	6065eu			
2330-2400	United Kingdom, BBC London	5975na	6175na	6195as	7180va
		7325na	9570na	9590na	9915na
		11945va	15260sa	15280va	
2330-2400	Vietnam, Voice of	9840as	12020as	15010as	
2335-2345 smtwhf	Greece, Voice of	9425sa	11645sa	15650sa	
2345-0000	Croatia, Croatian Radio	5085eu	6210eu	9830eu	13830eu

SELECTED PROGRAMS

Sundays

- 2300 KSDA, Guam: Music Scrapbook. No details available.
 2300 Radio For Peace Int'l: World Of Radio. See S 0200.
 2305 BBC: World Business Review. The previous week's news and upcoming events.
 2315 BBC: Classics With Kay. Brian Kay with his choice of classical music.
 2315 KSDA, Guam: Bible In Living Sound. Dramatized Bible stories.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: The World In Review. See S 1530.
 2345 Radio For Peace Int'l: RFPI Reports. See S 0230.

Mondays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2300 Radio For Peace Int'l: New Dimensions Radio. See M 0300.
 2305 BBC: World Business Report. The latest news from the markets worldwide.
 2315 BBC: Talks. Liz Edwards profiles South Asian women in "Sparks From A Precious Stone" (5th); join me in asking the question, "But Why A Degree?" (12th, 19th, 26th).
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 BBC: Multitrack 1. Tim Smith presents the smash singles on the UK pop-music charts.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: UNESCO. A selection of programs presenting the cultural heritage of many nations.
 2345 Radio For Peace Int'l: RFPI Reports. See S 0230.

Tuesdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2305 BBC: World Business Report. See M 2305.

- 2315 BBC: Concert Hall. See S 1515.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: Dialogue. News from the University for Peace in Costa Rica.
 2345 Radio For Peace Int'l: RFPI Reports. See S 0230.

Wednesdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2300 Radio For Peace Int'l: Common Ground. International relations and related political and social issues.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: From Our Own Correspondent. See S 0330.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2325 All India Radio: Commentary. See S 1340.
 2330 BBC: Multitrack 2. Graham Bannerman presents new pop records, interviews, news, and competitions.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: Population Update or FAO. Population-related issues or reports on food and agricultural production.

Thursdays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2300 Radio For Peace Int'l: Peace Forum. See S 0300.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Music Review. News and features from the world of classical music (except 8th: St. Matthew Passion, part two of Bach's work for Easter).
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: United Nations. See M 0245.

- 2345 Radio For Peace Int'l: RFPI Reports. See S 0230.

Fridays

- 2300 KSDA, Guam: Music Scrapbook. See S 2300.
 2300 Radio For Peace Int'l: World Citizens Weekly Commentary. No details available.
 2305 BBC: World Business Report. See M 2305.
 2315 BBC: Multitrack 3. A roundup of the week's news headlines and developments.
 2315 KSDA, Guam: Bible In Living Sound. See S 2315.
 2330 BBC: Multitrack 3. Sarah Ward presents the latest from the alternative pop scene.
 2330 KSDA, Guam: Voice Of Prophecy. See S 0130.
 2330 Radio For Peace Int'l: RFPI Reports. See S 0230.

Saturdays

- 2300 KSDA, Guam: Micronesia Snapshots. See A 1600.
 2300 Radio For Peace Int'l: Red Cross Roads or The CFRU Series. See S 1500.
 2305 BBC: Words Of Faith. See M 1209.
 2310 BBC: Book Choice. See W 0425.
 2315 BBC: A Jolly Good Show. See T 1515.
 2315 KSDA, Guam: DX Asiawaves. See S 0215.
 2330 KSDA, Guam: Focus On Living. See A 0215.
 2330 Radio For Peace Int'l: The World In Review. See S 1530.
 2340 Radio Nacional, Bogota: Feature. Topical programming on various issues.
 2345 KSDA, Guam: Probe. See S 0245.
 2345 Radio For Peace Int'l: RFPI Reports. See S 0230.
 2350 Radio Nacional, Bogota: Colombia DX. News for shortwave radio listeners.

Monitoring Vignette

By B.W. Battin, MT Frequency Monitor

I've concluded that one of the things that makes shortwave listening so much fun is the mystery of it.

For years, two stations I absolutely could not get were Radio Luxembourg and All India Radio. Well...on occasion I could hear a barely discernible voice buried deep in the static and garble of signals that inhabit the shortwave bands, but nothing I could positively identify, much less listen to.

It had always seemed to me I should be able to hear Luxembourg, since it has adequate power and other European countries come in just fine. With India, I understood the problem; it's on the other side of the world.

Then a few months ago I was at the dial of my R-71A, looking for stations to include in my monthly report to *Monitoring Times*. And there it was on 15350, strong and clear, the station once legendary for broadcasting rock and roll throughout Europe. It came in every afternoon for several weeks, then once more slipped into the static, and I've only heard it one time since.

This past November I was again preparing my monthly report for *MT*, and I came upon an unfamiliar station on 11620. I was stunned when the announcer stated that I was listening to India. (Had he known the effect his words had on me, he wouldn't have spoken them so calmly.) This signal was even better than Luxembourg's had been. No fading, no flutter, entirely listenable. A month later India was still there on the same frequency, nice and clear from 1800 to 2000, and then again at 2100. In time, it too will probably fade away, but as I write this, it hasn't yet.

Another example comes in the form of a station much closer to home. KJES in Mesquite, New Mexico. That's just north of El Paso, Texas, about 280 miles south of me. The station started appearing in the Shortwave Guide on 11715, surrounded by asterisks to show that it was something brand new. Right away I started looking for it, but it wasn't there. Not a trace.

I was beginning to worry that the powers that be at *Monitoring Times* would think I was

goofing off, that they'd be saying, "Hey, can't this guy report a station that's right there in his own state? He ought to be able to hear that sucker on the fillings in his teeth. What's he doing out there?"

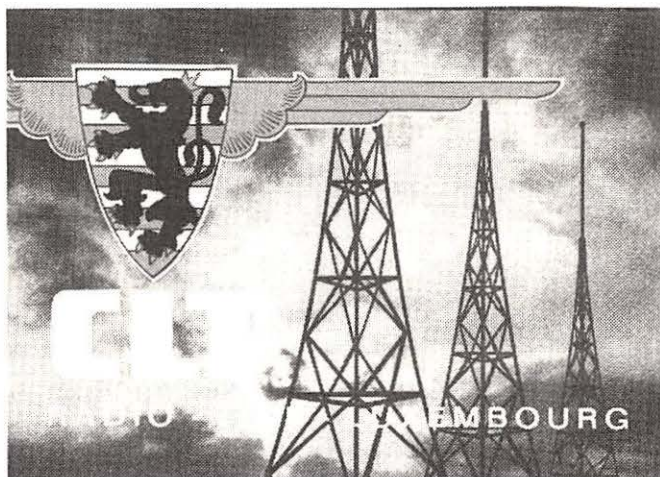
And then one day in December I heard KJES on an entirely different frequency, 9510. And strong. Very strong. One of those signals that could almost make the radio tap dance across the tabletop. A day or two later, I finally heard the station on 11715. Barely audible.

Why the difference? It's probably related to my proximity to the transmitter. And the reason India is suddenly coming in most likely has to do with solar activity's effect on the polar region, over which the signal must travel. As for Luxembourg, who knows? And to tell you the truth, knowing the reasons isn't really all that important. I'm perfectly willing to put it down to the vagaries of the ionosphere. Or if you will, the mysteries of shortwave.

And, as I said at the beginning, that's what makes this hobby so fascinating. You never know what you'll find when you turn on the radio.

MT

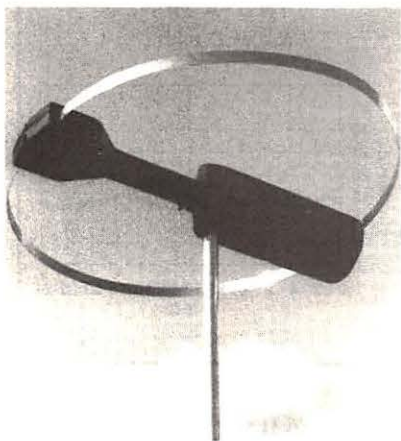
Since the first of the year, Radio Luxembourg no longer broadcasts in English on shortwave. But like a will-o-the-wisp, it drifted in long enough for B.W. to log it at last, and then was gone again.



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PK-232MBX DIGITAL MULTI-MODE CONTROLLER.

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Here's the superior way to decode multi-level gray fax images received by your general coverage receiver. Featured is AEA's exclusive on-screen tuning scope that allows you to simultaneously tune and receive. There is also Autolist for unattended image capture and save-to-disk, "daisy-chain" external RS-232 input allowing AEA-FAX to share a COM port with PK-232 MBX, up to 16 gray levels (VGA), support for EGA, CGA and Hercules formats. AEA-FAX prints to HP LaserJet or Epson compatible printers and includes hardware demodulator, 3 1/2" and 5 1/4" software disks plus a comprehensive instruction manual. AEA-FAX is a must for your set-up!

To connect with the AEA dealer nearest you or for product sheets, call (800) 432-8873.



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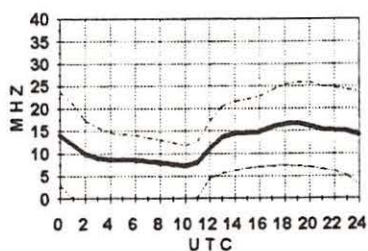
Advanced Electronic Applications, Inc.

PO Box C2160, 2006 - 196th St. SW, Lynnwood, WA 98036 Sales: (206) 774-5554

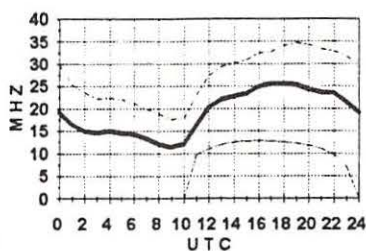
Propagation conditions: Eastern United States

How to use the propagation charts: Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location. Then look for the one most closely describing the geographic location of the station you want to hear.

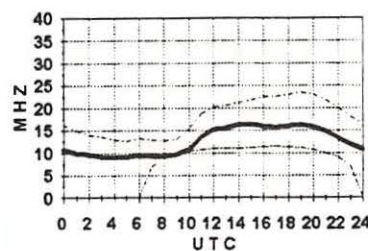
CENTRAL AMERICA
Belize



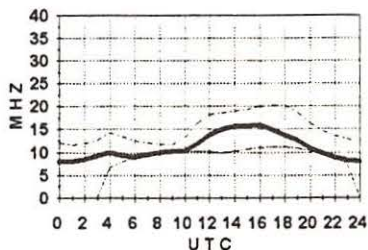
SOUTH AMERICA
Brasilia



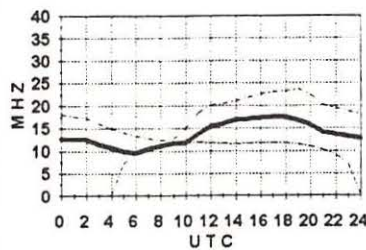
WESTERN EUROPE
London



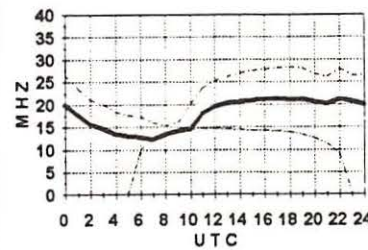
EASTERN EUROPE (P)
Moscow



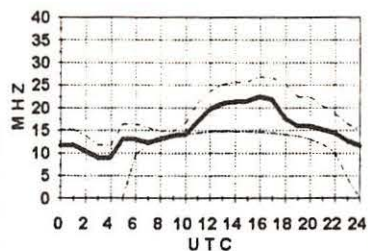
NEAR EAST
Iraklion



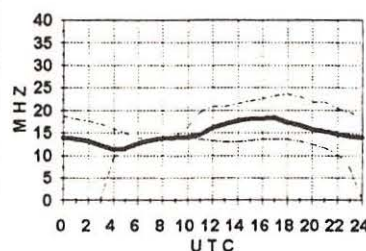
CENTRAL AFRICA
Kisangani



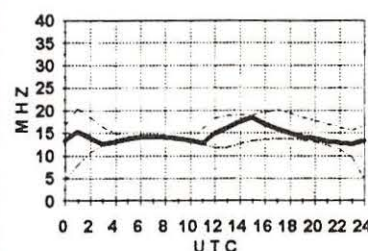
SOUTH AFRICA
Johannesburg



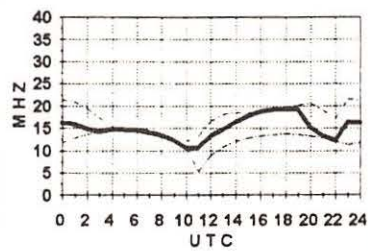
MIDDLE EAST
Kuwait City



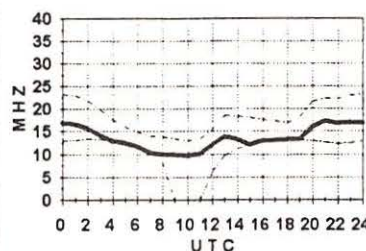
INDIA (P)
New Delhi



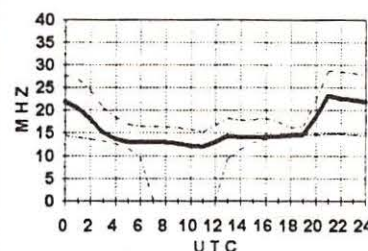
SOUTHEAST ASIA (P)
Singapore



FAREAST (P)
Tokyo



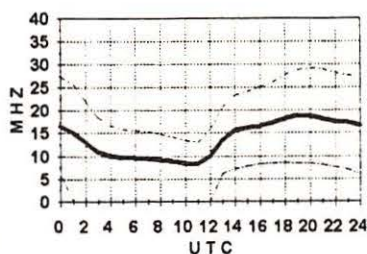
AUSTRALIA
Melbourne



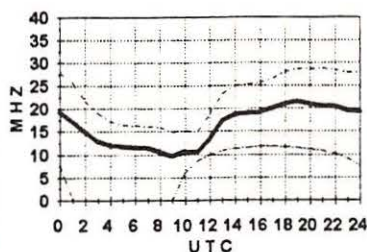
Propagation Conditions: Western United States

Once you've located the correct charts, look along the horizontal axis of the graph for the time you are listening. The top line of the graph shows the maximum usable frequency (MUF), the heavy middle line is the frequency for best reception, or optimum working frequency (OWF), and finally, the bottom line is the lowest usable frequency (LUF). You will find the best reception along the heavy middle line. Circuits labeled (P) cross the polar auroral zone. Expect poor reception on these circuits during ionospheric disturbances.

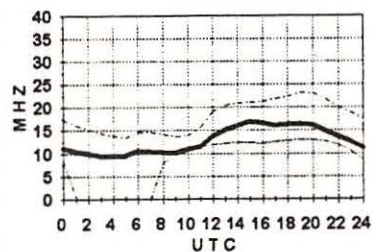
CENTRAL AMERICA
Belize



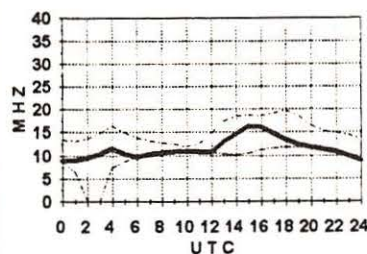
SOUTH AMERICA
Brasilia



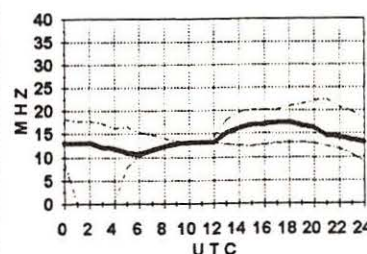
WESTERN EUROPE (P)
London



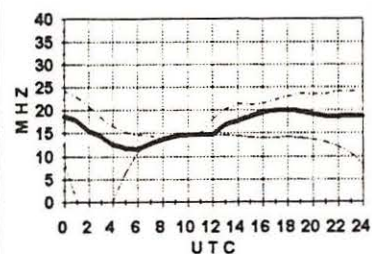
EASTERN EUROPE (P)
Moscow



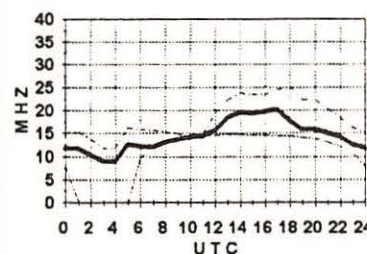
NEAR EAST (P)
Iraklion



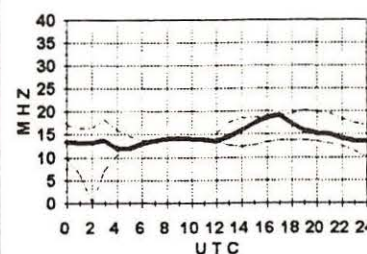
CENTRAL AFRICA
Kisangani



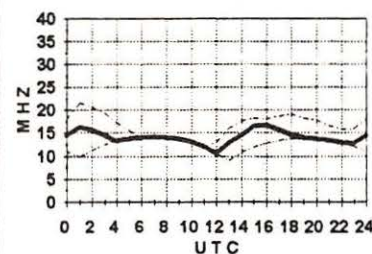
SOUTH AFRICA
Johannesburg



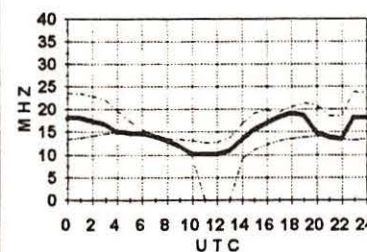
MIDDLE EAST (P)
Kuwait City



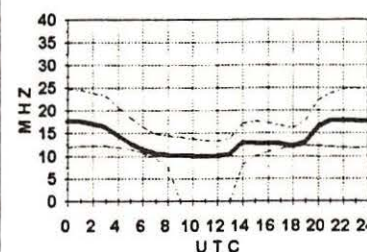
INDIA (P)
New Delhi



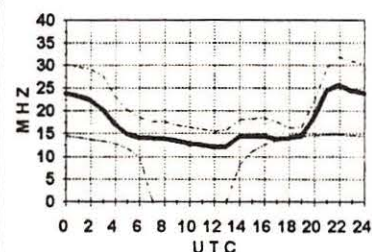
SOUTHEAST ASIA (P)
Singapore



FARE EAST
Tokyo

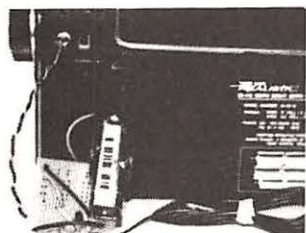


AUSTRALIA
Melbourne



what's new?

Larry Miller



Tiny Tenna

Some time ago, there was a firm whose slogan was, "Where Radio Is Fun Again!" Radio had never stopped being fun for me, but it was still a catchy slogan. And, believe it or not, there are still neat, inexpensive, fun things out there for the radio listener.

DWM Enterprises has introduced what it calls the "Tiny Tenna," an all-band active antenna that can be used on longwave, mediumwave or shortwave. It meets all of the major "fun" requirements. It works! It's inexpensive.

The Tiny Tenna is not, however, for the person who demands "pretty," jet-powered, high-performance equipment. There is no fancy cabinet, no flashing lights or animated meters (see picture). It's mounted on a 1-1/2 x 1-1/2 inch circuit board. But it does work. The price is just \$19.95. And it's fun! This is about as close to what radio used to be like as you can get today.

The Tiny Tenna runs on a single 9-volt battery or can be plugged into the wall with a 12 volt adapter and comes with complete hook-up instructions.

To order, send a check or money order for \$19.95 plus \$3.00 shipping and handling to DWM Enterprises, 1709 N. West Avenue, Jackson, Michigan 49202. Mention *Monitoring Times* when you write.

Utility Bible

Just about every reference publication that hits the press bills itself as "the bible" of one thing or another. The phrase generally refers to a book's accuracy, links it to the highest authority and recommends it as an indispensable daily guide. It's a tough claim to live up to.

So how does the new 11th edition of *Guide to Utility Stations* stack up to the "bible" claim? Let's give you a hint.

(All heads bowed, please.) St. Joerg Klingenfuss, radio monitor and publisher since the 1960s, has assembled a book that contains some 19,549 frequencies, 3,590 callsigns, FAX and RTTY press and meteo schedules, plus abbreviations, codes, frequency allocations and radio regulations. Since the last edition, Klingenfuss has combed through enough spectrum to uncover 11,800 changes.

If you monitor utility stations, either seriously or as a sideline, you should have this book. While the *Guide* is packed with more information than one person could

digest in a lifetime, of most use to many monitors will be the "by-frequency" listing, where each station is identified by callsign, location, and mode, along with other helpful information. Although it lacks the graph-like presentation, this book is a lot like a utility version of *Passport to World Band Radio*.

Imported from Germany, *Guide to Utility Stations* varies in price and availability, but is well worth the search and the dollars spent. It's \$36.95 plus \$2 bookrate from Grove Enterprises, or you can also order direct from the publisher by charging 70 DEM (roughly US\$50.00) to your American Express, Visa or Mastercard (includes airmail delivery). An optional twice-annual supplement is available from the publisher for an additional 20 DEM. Write Klingenfuss at Hagenloher Str. 14, D-7400 Tuebingen, Germany.

By the way, Joerg invites you to contact him in Creole, English, French, German, Indonesian, Italian, Malay, Portuguese or Spanish.

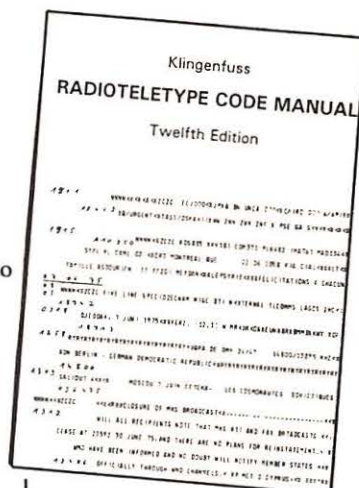
RTTY Bible

"And on the second day, Klingenfuss created the *Radioteletype Code Manual*!"

This is not a frequency book, but if you have any interest in RTTY, it's another "must have." Covered in the *Radioteletype Code Manual* is everything from a discussion of shortwave propagation characteristics affecting radioteletype circuits to definitions to modulation types to non-standard teleprinter alphabets like Third-Shift Amharic.

Clearly not light reading for the kids, it is genuinely great, hard-to-find stuff for anyone who has an interest in RTTY.

The *Radioteletype Code*



Manual is DEM 30 from Klingenfuss Publications (address above).

The Best of the Crystal Set Society

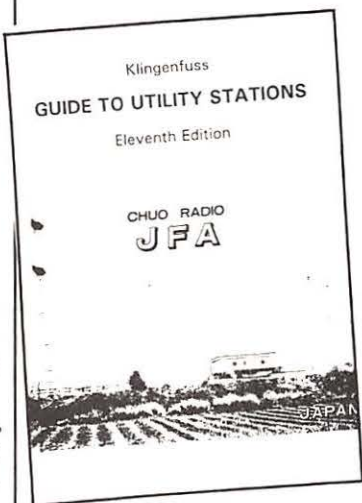
A publication that we've never heard of has produced a "Best of" anthology that we haven't seen. According to a press release from The Xtal Set Society, it has released *Volume One - The Xtal Set Society Newsletter*.

Volume One includes historical articles and lots of helpful "how to's." There's a look at crystal sets of the 1920s, listening to HF on a crystal set, matching your antenna and set for maximum reception and a complete set of plans for building a modern-day crystal set.

The book is \$9.95 plus \$2.50 shipping from The Xtal Set Society, 789 N. 1500 Road, Department MT, Lawrence, Kansas 66049-9194. Let us know what you think of the book if you buy one.

Professional Aero Monitoring

A firm called Aerial Development of New England is a firm offering a line of what they call



"aeronautical reference products." These include such items as U.S. Government surplus Department of Defense IFR Supplements, Global Flight Information Handbooks, Oceanic Planning Charts, military training routes, among others. The *Military Training Routes: North and South America* that we received is dated as "effective between 15 October 1992 and 10 December 1992."

It contains special notices, IFR (Instrument Flight Rules) military training routes (IR), VFR (Visual Flight Rules) Military



Training Routes (VR), Slow Speed Low Altitude Training Routes (SR), Refueling Tracks/ Anchors/VFR Helicopter Refueling Tracks, and avoidance locations. The book is 636 pages long. Amazingly, it's only \$3.80 cents (plus \$3.40 shipping and handling).

For the hard-core aeronautical monitor, this pack of information is nothing short of heaven. Those less experienced will find the book only a little more helpful than a cyrillic phone book for Leningrad. Still, price is on your side.

Aerial Development of New England also offers current material as well.

To get a complete list of publications, contact Aerial Development of New England at P.O. Box 361-MT, Bangor, Maine 04402-0661 or call 207-945-3961.

Pirates in America

When George Zeller came to town, pirate radio monitoring took on a new flavor. Zeller's got the pirate scene covered like no one else, as his work in *Monitoring Times* will undoubtedly confirm.

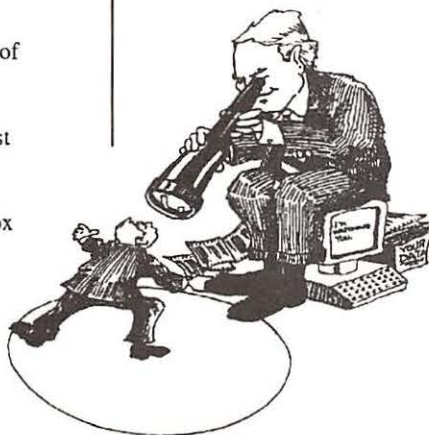


But, alas, Zeller is only allocated two pages in *MT* each month and there's so much more to know.

That's why, every year, Zeller puts out *The Pirate Radio Directory*. The book, which is packed with "how to" and historical information, focuses on pirate profiles, giving an exciting and fascinating in-depth look at the people and groups who take to the airwaves in the face of the FCC.

This year's brood of pirates features some old favorites and a number of new voices, all of which range from the frightening to the funny to the pathetic.

The Pirate Radio Directory is available from Tiare Publications (P.O. Box 493-MT, Lake Geneva, Wisconsin 53147) or Grove Enterprises for \$9.95 plus 2.00 book rate shipping.



Surveillance Expo '93

It's not too early to plan on attending Surveillance Expo '93

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BNC Mag Mount	12.95
Custom Ground Plane	39.95
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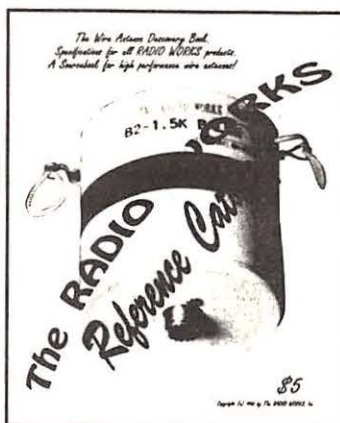
CK-MO-MC-VISA Accepted (MA add 5%)
US shipping and handling \$4.00

in McLean, Virginia. Billed as "The International Security Technology Showcase," it's a place where you can see new technology, learn new methods and touch new products. It's a real "hands on" event for the serious security professional. Last year's event was even covered on CNN.

The dates of the event are August 10, 11 and 12 and you can obtain information by contacting Jim Ross and Surveillance Expo '93, P.O.B. 20254, Washington, DC 20041. Tell 'em *Monitoring Times* sent you.

Radio Works

The Radio Works "reference catalog" is so big that it's really a magazine — or a book. Running 128 pages, it is packed with useful information on building, installing and optimizing wire



antenna systems and maximizing ham radio station performance.

Besides full descriptions of all Radio Works baluns and antennas, there are reference articles about DXing on a budget, the importance of the decibel and how little improvements add up to high performance. There are articles on "High Performance Wire Antennas," "Installing Wire

Antennas in Trees," "Knots and Pulleys," and much more. There are even several pages devoted to its support line.

This is definitely a catalog, and a big one. But author/owner Jim Thompson has found a way to make you want to read it. The Reference Catalog is \$5.00 but if you mention *Monitoring Times* it's just \$4.00 postpaid.

The address: P.O. Box 5169, Portsmouth, Virginia 23703.

Low Profile Ham

The outside amateur antenna — not to mention shortwave monitoring and scanning — are under increasing fire from various clumps of crazies. Self-appointed "concerned citizens," overstarched next-door neighbors, homeowners' associations and even overzealous local politicians have all tried to turn the simple task of putting up an outside antenna into a possible supreme court battle.

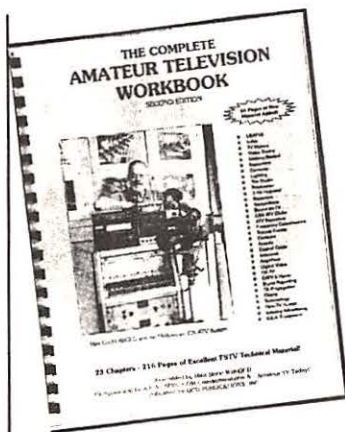
Author Jim Kearman has put together a book on how to operate a ham radio station without attracting attention.

Chapters are devoted to low-profile operation, small HF and VHF antennas for apartment dwellers, and solving interfere problems. The book has a bit of a "spy" feel to it. But then again, they're the people with the most experience in operating low profile radio transmitters.

Low Profile Amateur Radio is just \$8.00 from the ARRL, 225 Main Street, Newington, Connecticut 06111. No shipping information was provided but there is a phone number for those who are interested: 1-800-243-7767.

ATV Book

It is, says editor Mike Stone, "absolutely the best ATV book ever written." ATV, for those unfamiliar with the term, stands for Amateur Television. "The best

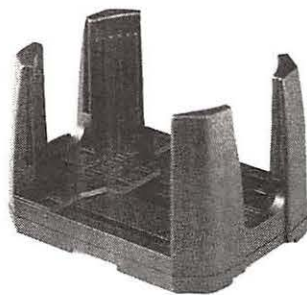


book" is called *The Complete Amateur Television Workbook* and it's now in an updated 2nd edition.

In all, there are 23 chapters of excellent video information covering some 216 pages. There are even three kit projects and an expanded antenna section plus a national USA ATV Repeater directory.

You can get your copy from the publisher, QCD Publications, Inc., 770 Quincy Avenue, Clarence, Iowa 52216-9368. The price is \$18.95 plus \$1.00 shipping.

Interestingly, the publisher offers a \$5.00 rebate if you return your "unharmed" first edition of the book.



Handheld Radio Mount

A perennial problem among hams and scanner listeners is how to secure a hand-held radio in the car or on a desk or tabletop. With antenna and power cords dangling from it, falling off the seat or other surface is just about guaranteed. A creative solution to the problem has now come from Grove.

Originally designed as a vise-like cup holder, the Grove handheld mobile mount is a sturdy, adjustable "lock-in" device for cars, trucks, vans, boats, and flat surfaces as well. It comes with methods of attachment to seat cushion, floor hump, armrest, dash, console, window or door. Illustrated mounting instructions are included.

A ratchet-operated slide permits secure jaw adjustment of from approximately one inch to four inches; a lock mechanism prevents the set from slipping. Four durable "fingers" secure the hand-held in position. Soft adhesive cushions are provided to secure a small radio without marring it.

The fingers allow for power, antenna, mike and control cables to remain attached on sides, back and top, as well as permit viewability of the radio from the front.

Removal of the hand-held radio for security when leaving the vehicle is a snap—literally. A slight pull on the release lever opens the jaws and out comes the radio.

And you may just wish to get an extra one to use for its original intent—a very secure drink holder!

Order ACC106 Handheld Mobile mount, \$12.95 plus \$4 shipping from Grove, 1-800-438-8155.

Scrambling Telephone

As *MT* readers well know, cordless telephone conversations are easy to overhear with a scanner; what's more, it's perfectly legal to do so! This vulnerability to interception has given cordless telephones a bad name, and justifiably so.



Now Radio Shack has come to the fore with their new ET-499 (catalog number 43-565) ten-channel, voice scrambling, cordless telephone, a low cost (\$159.95) alternative to more expensive (\$300-\$400) CT-2 900 MHz spread spectrum cordless telephones.

The unit we tested offered superb clarity and excellent range, two common areas of complaint in competitive phones. It also allows base-to-handset paging and a 30-phone number memory with speed dialing. All the other amenities of cordless phones are there as well.

The privacy technology is speech inversion, commonly heard on many law enforcement channels and commonly referred to as "Donald Duck" or "monkey chatter," sounding much like improperly-tuned single sideband.

We suspect that an enterprising individual could use such a telephone as a speech inversion decoder simply by setting the telephone in front of a scanner which is receiving a scrambled transmission, and listening to the cordless base on another scanner.

On the other hand, law enforcement agencies could use the cordless handset as a room bug, monitoring any one of its ten channels on its companion base from a nearby room; a hapless scanner listener would overhear only the inverted (scrambled) speech—unless he also had an ET-499 and a second scanner!

The Duofone ET-499 is an interesting product which deserves serious attention.

Reviews

By Bob Grove



SCA-Capable FM Radio From FM Atlas

A few months back we reviewed the new model GE Superadio III; a note from Bruce Elving of *FM Atlas* invited us to sample his special SCA adaptation of the former model, the Superadio II (GE 7-2885), still preferred by many as the better radio.

SCA (Subsidiary Carrier Authorization) is the system used by FM broadcasters to transmit subscriber services like Muzak, reading services for the blind, stock market reports and even medical updates for physicians.

Because broadcasters can be understandably upset by loss of revenue, it is a good idea to check with the station before listening on a regular basis, and by no means should you utilize any of the programming in a place of business without authorization!

Check it out

We tested Elving's SCA-adapted model which has a slide switch (SCA on/off) and tuning knob (67/92 kHz SCA tuning) on the lower side of the radio. At a distance of some 100 miles and using only the set's telescopic whip antenna we heard SCA programming clearly (with some background noise) from several FM stations.

The refurbished radio with custom SCA installed is \$89 plus \$4.50 shipping (\$7 Canada) from FM Atlas, PO Box 336, Esko, MN 55733-0336.

PRO-2006 Mobile Mount

The Realistic PRO-2006 is probably the most popular desktop scanner on the market, and perhaps of all time. While it has a permanently attached AC cord, there is a 13.6 volt DC jack on the rear apron for battery

operation, but there was no convenient way to mount it — until now.

A new, heavy-duty, flat black, steel mount has been released that does a super job of holding the 2006 sturdily in place in a mobile environment. Featuring padded, no-scratch cushions and a quick-release hinged latch, the handy accessory comes with all mounting hardware.

ACC102 mobile mount, \$24.95 plus \$4 shipping from Grove Enterprises, P.O. Box 98, Brasstown, NC 28902; phone orders 800-438-8155.

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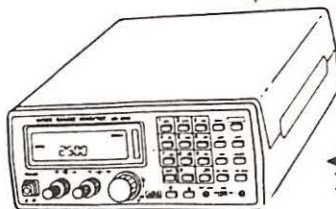
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AR-2500, 1 TO 1500MHZ, 2000ch, LCD DISPLAY	449.00
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Realistic® PRO-46 Handheld Scanner

Made by Uniden for Radio Shack distribution, the new PRO-46 handheld scanner is going to give Uniden's own BC200XLT a run for the money.

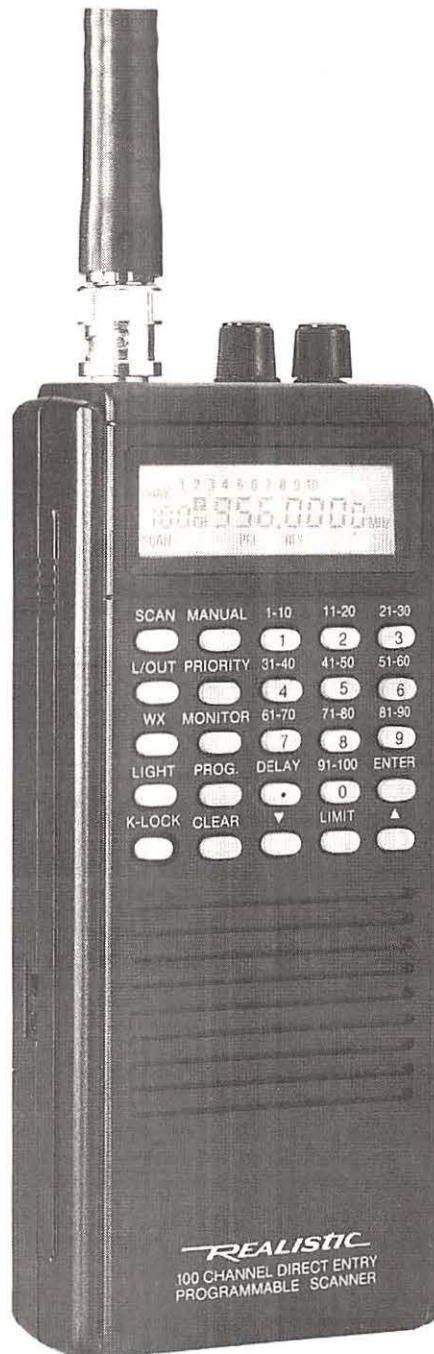
The PRO-46 is an inch and a half shorter as well as lighter in weight than the Bearcat, and accepts both replaceable AA cells or rechargeable nicads. Included are a belt clip and flex whip.

Keyboard entries are confirmed by an audible beep. Frequency range is typically Uniden: 29-54, 108-174, 406-512 and 806-956 MHz (less cellular). Up to 100 channels may be stored in ten memory banks and scanned—up or down—at approximately 20 channels per second (the same as the search rate). An additional 10 monitor channels can be temporarily stored in the search mode.

Acceptable Sensitivity

Sensitivity is several dB lower than that of comparable Bearcat scanners, probably by design. Every 1 dB reduction in sensitivity results in a 3 dB reduction in intermodulation, the most common cause of interference in metropolitan areas.

In actual listening applications, it is unlikely that owners will notice the reduced sensitivity; during our lab tests we had to strain to hear the difference in reception between the PRO-46 and a reference BC-200XLT, even on the weakest signals.



220 milliwatts of audio seems ample from the internal 1-1/2" speaker, and certainly from an optional earphone. Unlike the BC-200XLT, there is no anti-blast resistor in the earphone circuit, so full volume is available from the 1/8" mini phone jack.

Scanning the Memories

The scanner uses the familiar Uniden dual conversion IF: 10.8 MHz and 450 kHz. Any channel may be selected for priority, temporarily locked out of the scan sequence, or delayed for 2 seconds before scan resumes after signal dropout. A keylock prevents accidental erasure or activation of keys.

An instant weather channel key, when activated, scans the five NOAA National Weather Service broadcast channels for your local frequencies.

In the eventuality that the owner wishes to erase all memory contents, a simple press of the 2 and 9 keys while the power is being switched back on will erase all memory locations, leaving 000.0000 in their places.

The 35-page owner's manual is packed with easy-to-read instructions as well as helpful hints for better reception. Printed on glossy paper stock, it is well illustrated and intelligently laid out.

The Realistic® PRO-46 handheld scanner is \$199.95 from Radio Shack outlets nationwide or from Grove Enterprises, 1-800-438-8155.

M_T

REALISTIC[®] HAS STRUCK AGAIN!



"Made by Uniden for Radio Shack[®] distribution, the new PRO-46 handheld scanner is going to give Uniden's own BC200XLT a run for the money." – Bob Grove

Shorter and lighter than the Bearcat, the PRO-46 accepts both replaceable AA cells and rechargeable NiCads. Includes a belt clip and flex whip.

220 milliwatts of audio is available from the 1/8" mini phone jack.

Frequency ranges are: 29-54, 108-174, 406-512 and 806-956 MHz (less cellular). Up to 100 channels may be stored in ten memory banks and scanned--up or down in direction--at approximately 20 channels per second. An additional 10 monitor channels can be temporarily stored in the search mode.

Instant weather channel selection!

One-step erasure of all memory contents!

Any channel may be selected for priority, temporarily locked out of the scan sequence, and delayed for 2 seconds before scan resumes after signal dropout. A keylock prevents accidental erasure or activation of keys.

The 35 page, well-illustrated owner's manual is packed with easy-to-read instructions and helpful hints for better reception.



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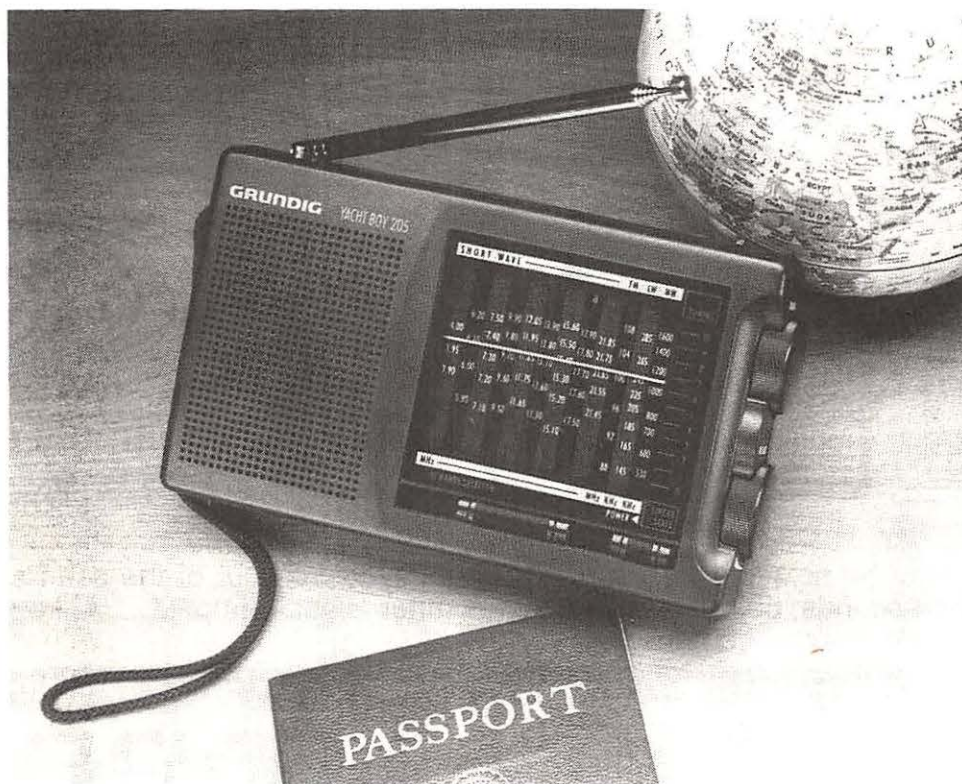


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Grundig YB 205 Low-Cost Travel Radio



Whatever cheer we have been able to take from Grundig's impact on world band radio, it hasn't included price. In North America, as flipping through radio catalogs shows, Grundig radios typically sell for a good deal more than comparable models from other manufacturers.

Well, *tempus fugit*. Grundig has finally broken with its pricey-pricing pattern to offer an unpretentious little analog travel portable with a list price of \$49.95. Allowing for discounting, that's pretty much in line with, and even cheaper than, comparable offerings from

other established larger manufacturers. These days, that's good news, indeed.

Reasonable Coverage, Inaccurate Readout

The Grundig Yacht Boy 205, made in China, covers world band from roughly 3800-4050, 5850-6230, 7050-7550, 9450-9950, 11550-12100, 13450-13950, 15070-15640, 17430-17940 and 21350-21900 kHz. As Grundig's Chinese manufacturer appears to be downright

sloppy with frequency alignment during assembly—our unit misreads by as much as 70 kHz—these frequency tuning ranges should be regarded as no more than reasonable approximations of what you may actually encounter.

The '205 covers the AM band, of course, but only up to about 1620 kHz, far short of the soon-to-be-instituted 1700 kHz band upper limit in the Americas. FM is the usual 87.5-108 MHz, mono only, plus there's longwave coverage for globehoppers.

The '205, like the highly rated Sangean ATS-606 reviewed here last month, may be considered as barely qualifying as a mini. Being analog tuned, Grundig's little model, which uses only two "AA" cells, is "mini" on the battery budget, too.

Few Features, but Handy

Although the '205 hardly bristles with fancy features, it does have a flip-down rear panel to angle the radio properly for handy operation. And, unlike most low-cost travel portables, its antenna swivels, as well as rotates, at its base. This may seem like small potatoes, but if you've ever tried listening to a radio which lacks a swiveling antenna, you know how aggravating it can be. World band signals come in best when the antenna is vertical, so you have to keep such sets balanced on their itty, tipsy bottoms for decent reception.

Grundig's offering doesn't come with headphones, a travel power lock or an AC adapter; but it does come with a soft-side travel case. Its single-LED tuning indicator is nigh useless and there is no single-sideband demodulation.

Typical Performance

Performance offers few surprises. Sensitivity to weak signals, typical for the genre, is fair. Ditto adjacent-channel selectivity, which is rather wide, even if not ridiculously so. Image rejection is mediocre, again characteristic of its price class. In all, although performance is adequate for reception of healthy signals, this is clearly not a set for seeking out rare and exotic DX.

Superior Audio Quality and Warranty

What does stand out is audio quality. No, it's not hi-fi, or even middle-fi. But your ears do tell you right off that this is not the squawk box most such radios are. Added to this is the '205's FM performance, which is quite respectable for a radio of this sort.

One unfortunate characteristic of most cheap shortwave radios is that they're sold on the fly by firms that aren't in a position to back them up with service. Grundig is among the relatively few to offer a full year's warranty...and they have the resources to back it up.

With Chinese-made radios, this may be more than academic. Our firsthand experience, confirmed by readers, is that Chinese world band radios don't have much staying power. It's too early to tell whether Grundig's fussy German negotiators put the Chinese manufacturer's feet to the fire in this regard. Yet, our unit, at any rate, seems to have been assembled, even if not aligned, to somewhat higher standards.

Overall: A Step Forward for Grundig

The Yacht Boy 205 shows that Grundig can manufacture a product which competes well at a popular price. This model is hardly revolutionary—*nothing* analog can be considered revolutionary—but it sits smack among the better offerings in its price and size class.

Now, with this competitive pricing, it looks as if we have something else about Grundig to cheer about!

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Personal Code Explorer

Can Software Beat a Dedicated Machine for Decoding Signals?

Cast Your Vote...Then Read On

Using the computer as a display terminal for units which decode digital signals, such as RTTY and Morse, is a major use for computers in our hobby. Decoder units such as the AEA PK-232 and Kantronics KAM really just rely on the computer to display (and control) the processing which is going on inside the decoder box, not the computer. What a waste of computer power! This method of using a computer is sometimes called a "Dumb Terminal," for obvious reasons.

The argument that is usually given for this approach is that a specialized processing environment, such as these decoding boxes, provides wider signal decoding capabilities and fewer decoding errors. This month we'll put this argument to the test with the review of a product called "Personal Code Explorer," version 1.0, or PCE for short.

Okay, so what can PCE decode? Morse code, Baudot, RTTY and ASCII, for starters. But that's not all; Sitor, Amtor and Navtex decoding is included with PCE. 300 Baud Packet and multi-level grey-scale FAX round off the PCE package—very impressive.

PCE from Microcraft Corporation, will operate on any IBM compatible with a clock speed of 8MHz or higher and 512K or more of RAM. PCE will work with a 4.7 MHz clock; but Packet and FAX modes will not operate correctly. DOS 3.0

or higher is required along with an RS-232 port and a 360K floppy drive. Because of the large file size required by FAX pictures, a hard disk is recommended, but not a necessity. The video card/monitor can be either CGA, EGA or VGA.

The product consists of a small box which connects to the serial port of the computer. The box also has a lead coming out of it which connects to the speaker output of the receiver on which the signal is being monitored via an 1/8 inch plug. Two 5-1/4 inch, 360K floppy disks hold the program and utilities. Starting it is as simple as typing "PCE" and hitting the Enter key. A simple menu appears asking which type of signal you wish to decode. Pressing the corresponding number brings up a screen, the majority of which is area for decoded messages to be displayed.

The screen format is deceptively simple with the title showing what mode you are decoding and a few decode parameters on either side, and under, the title. The majority of the screen is available to display decoded messages. The bottom 25% is labeled SCOPE and shows the monitored signal as if on an oscilloscope. For example, while monitoring a Morse signal, the scope trace will show the line rising to the top of the SCOPE box when the Morse key is pressed. By watching how long the trace stays "high"

along the time co-ordinate of the horizontal, you can "see" a longer dash as compared to a relatively shorter duration dot. This is really "reading" code!

By pressing the "4" key the SCOPE freezes or holds the signal received for visual analysis. Pressing the key again turns "on" the SCOPE displaying the signal as it is received. The SCOPE parameter setting, either ON or HOLD, is shown on the top left of the screen next to the number 4 which indicates the key used to control the function—simple and easy without requiring memorizing pages from an instruction manual.

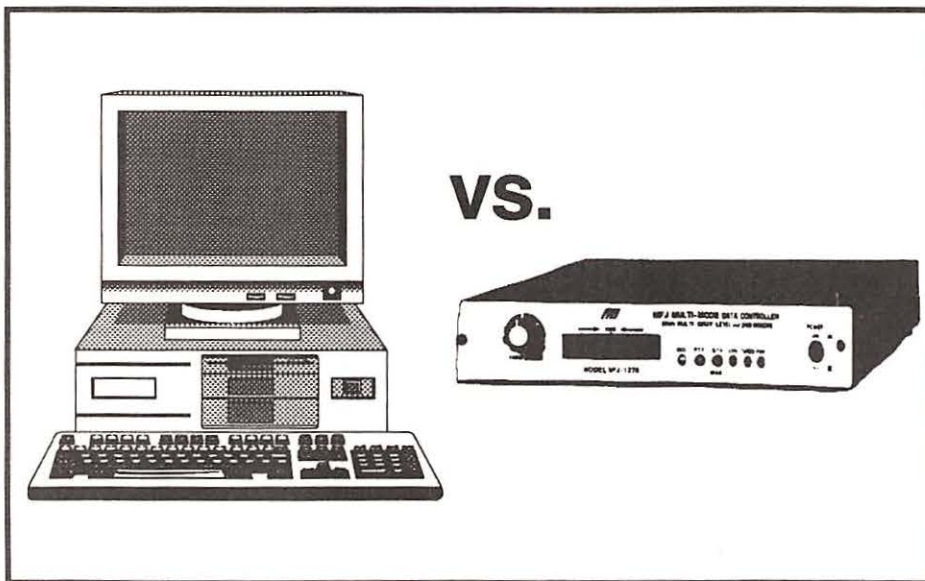
I liked the ease of operation. Even as a new user I was up and decoding in a few minutes from loading PCE. Another comforting command which is shown on all screens is, Esc = Main Menu. No matter how messed up you get, pressing the Escape key will get you out of trouble and bring you to the Main Menu screen. The other three commands on each screen are unique to the decoder signal type you choose. For MORSE the additional commands are MODE, SPEED and FILTER; each is shown next to the appropriate command key and the current status of each.

How Does it Perform?

We tried PCE and put it up against what I consider the best dedicated decoding unit on the market today: AEA's PK-232 MBX. "A bit unfair," I hear you say, "when the PK-232 costs over \$300 and the PCE is almost 1/3 the price!" Well, any test is meaningless unless it is relative to a known baseline standard. This is just plain good scientific method, and makes sense in the consumer world.

We started by trying to decode Morse code, perhaps the most challenging since most Morse is manually-generated and does not have regular/even dots and dashes. The results after 1/2 hour of trying was (to put it into the words of a visitor in the shack and my assistant for these tests) "not too good!"

The first thing that we noticed was the increase in background noise level when we plugged the converter into the radio. For the tests we used both an ICOM R-71 and a Yaesu FRG-7700. When we substituted the PK-232 for the PCE the noise level dropped from three S units to not even moving the S-meter. This indicates that we don't have as much isolation between the computer and



the receiver in the PCE as compared to the PK-232. This is a problem that is frequency sensitive; some received frequencies are worse than others. The Morse test was such a poor place to start the tests that we almost aborted them completely.

When we moved to the RTTY mode we were pleasantly surprised. After about seven minutes of trying to tune a signal, the decoding of an average strength (S-3) signal was error-free. The SCOPE feature worked *great* on RTTY, indicating the proper signal tuning easily. Four more signals of varying strength were tuned and decoded with ease using the scope feature. On to SITOR/FEC mode!

W-c-e-l-l, after almost 1-1/2 hours of tuning, adjusting, hitting function keys and just plain frustration without success, the heavy gun was reconnected. The PK-232 decoded the signals just fine! Re-connecting the PCE without changing the receiver tuning resulted in some intelligible copy. A slight re-tuning brought the AMTOR copy to about 60%, but PCE did not keep synchronized and started printing garbage after a few good words.

The problems with SITOR/FEC decoding seem to be twofold. The SCOPE method which worked so well for RTTY is not good enough for the more complex digital modes. The PK-232's LED bar allows you to tune the signal by lighting up the widest apart LEDs. PCE's SCOPE is hard to see and full of random dots, which may be the second part of the problem. Computer generated noise, which is being coupled to the receiver via the PCE interface, is probably the source of the dots on the scope. Even strong weather RTTY stations could not be decoded better than 70% of the time. The noise may be confusing the PCE program, creating the loss of sync and useful decoding—not exactly a success in the SITOR/FEC mode.

After testing the PCE for the good part of a day we were ready to start writing. But for completeness my visitor suggested we try the last mode: FAX. She reminded me that almost ten years to the day we had put a week of our lives into testing a FAX program in Europe, with no success! With the results of the last test fresh in my mind I suggested we only give the FAX mode 1/2 hour of our time. It was time well spent! We dialed in NAM, Norfolk on 8.080 MHz, pushed the "1" key on the FAX menu, and instantly, with NO tuning, NO adjusting, and NO pain, the weather FAX started to appear on the screen! It was just that easy and rewarding. In fact right now, two hours later, we are watching and saving faxes.

Wish List for the Next Version

Clearly, the interface should be worked on. To its credit, it is one of the few that is so sensitive

it works from the recording output of some receivers without tying up the speaker output. However, this sensitivity may be part of its downfall in picking up computer noise. Also more filtering on the output and/or opto-isolator decoupling of the computer power supply from the receiver's ground should be considered.

Although an excellent concept, the SCOPE feature should be further refined to cater to the demanding digital modes of SITOR/FEC. Perhaps the scope can be augmented by a simple "tune-to-maximum-spread" ala the PK-232 display. This simulated tuning bar should be possible on the computer screen above the scope.

With all that computing power available, especially on a 386 or 486, it's too bad that an automatic signal identification feature was not included in PCE. This would be a welcome and useful addition.

Finally, other than FAX mode, no provisions for storage of received text messages has been made. This would be a valuable feature for further versions of PCE to include.

Overall, the people at Microcraft Corporation should be commended for undertaking such an ambitious project. Their first attempt has resulted in a product which is excellent for the listener starting out in decoding RTTY and FAX. SITOR/FEC/MORSE need much more patience (that of a saint), plus the skill and experience of an advanced listener. If these modes operated as easily as RTTY and FAX this would be a super product. Currently at \$129.00, version 1.0, in my opinion, is a bit pricey in its current form, but its ease of operation in RTTY and FAX and its SCOPE feature should serve as models for decoding programs. I'll be watching out for the next version of PCE!

Personal Code Explorer, version 1.0, is available from Microcraft Corporation, P.O. Box 513, Thiensville, Wisconsin 53092, at a price of \$129.00 plus \$4.00 S&H in the USA (\$8.00 outside the continental USA). They also accept credit card phone orders at (414) 241-8144.

Postscript

By the way, if you are wondering who my assistant was with over ten years of radio/computer experience...., I'd like to thank my mother for giving up her Sunday! And of course, the *MT* editor would like to thank my former "frequency reader," my wife, for proof reading the column every month.

The C-64 has FINALLY been repaired, so next month we'll look at some programs which may be considered ancient, but are inexpensive and (possibly) useful to today's listener. How useful? Next month we'll see together.

MT

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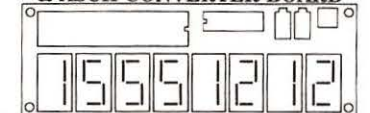
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Baluns and Antenna Height

I receive many technical inquiries that concern two popular antenna subjects. A frequently asked question is, "Should I use a balun in my antenna system?" The other item of concern is, "How high should my dipole be?" There is a lot of misunderstanding about both of these topics. Let's look into these matters from a practical point of view.

Baluns

First off, "balun" is an adjective. When used correctly the term should be "balun transformer." Balun is a contraction of three words—balanced to unbalanced. The purpose of balun transformers is to convert a balanced antenna feed point to an unbalanced condition to permit the use of coaxial cable for a feed line. While this conversion is occurring it is essential that the balun transformer maintain a matched condition between the antenna and the coaxial feeder.

For example, we may opt to use a folded dipole made from TV ribbon line. The feedpoint impedance of this antenna, at its resonant frequency, is approximately 300 ohms. We can place a 4:1 balun at the feed point and use 75-ohm coaxial line to feed the receiver or transmitter, thus maintaining a matched condition, while taking advantage of the coaxial feed line (RG-59 or RG-11).

Baluns are broadband transformers. They can be designed to work well from, say, 1.5 to 30 MHz. They operate at odd integers, such as 1:1, 4:1 and 9:1. These numbers represent impedance transformation ratios. However, when a balun is installed in a hostile environment it can ruin the performance of an antenna and it can introduce SWR (standing wave ratio).

All broadband transformers, including baluns, are designed for use in low-impedance circuits. The upper limit is on the order of 1000 ohms. At higher impedances, especially in a transmitting antenna, the balun core can become hot and lose its permeability. In a worst case example we can destroy a balun under these extreme conditions.

Misleading statements about baluns are sometimes found in manufacturers' ads. You will see comments like "baluns cure TVI" or "eliminate

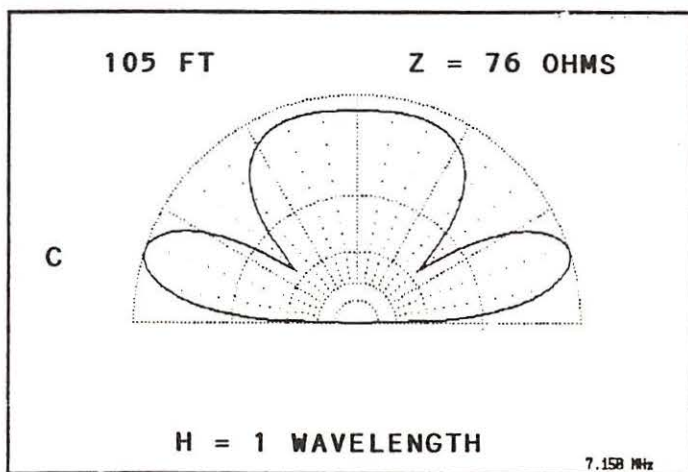
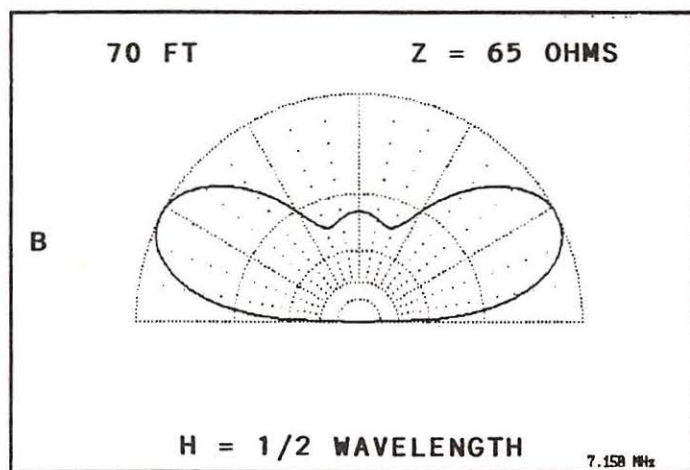
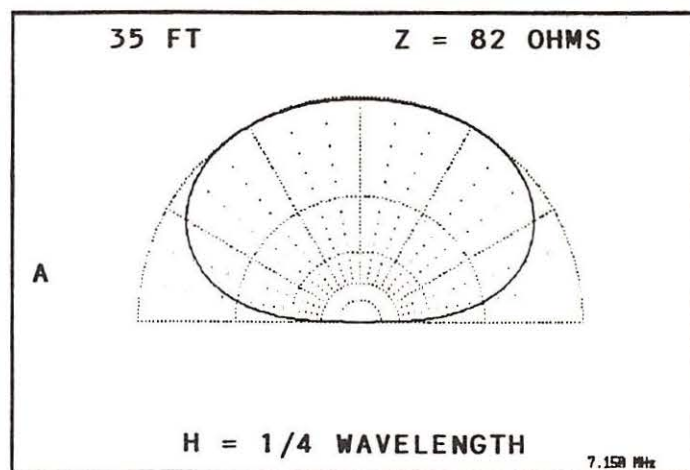


Figure 1: Radiation patterns for a 7158-kHz horizontal dipole at three heights above average ground. The example at A is suitable for short-haul signal response, but is poor for DX reception. Example B offers a good compromise between near-in and DX signals, while the pattern at C has very good low-angle lobes for DX along with a high-angle lobe for distances out to 1000 miles. These patterns were obtained from the MININEC computer program.

man-made noise in a receiver." This is pure fantasy! A feed line is balanced or flat when it is matched correctly to the antenna. Therefore, it does not radiate to cause some types of TVI (fundamental overload). If SWR does exist because of a mismatched system, a balun can make it worse.

No broadband transformer is without losses. The addition of a balun can cause a slight loss in transmitted or received signal strength. In other words, no broadband transformer can be made 100% efficient.

Do you need a balun for a dipole antenna? Definitely not. Make an effort to match the antenna to the feed line and forget about adding a balun.

Antenna Height

A dipole or beam type of antenna will work to some degree at any height above ground. The higher the antenna the better its DX capability and the greater its directivity. We tend to think of antenna height in terms of feet above ground. An 80-meter dipole may seem high above ground at 35 feet, as we stand back and survey our installation. Unfortunately, 35 feet at 3.5 MHz is only 1/8 wavelength! At 40 meters it is 1/4 wavelength (better) and at 14 MHz it is 1/2 wavelength (much better).

When we think of antenna height we should be considering wavelengths or fractions thereof in order to understand how the antenna will perform. Figure 1 illustrates by way of MININEC the differences in radiation patterns for a 40-meter dipole at three heights. Note that the radiation (and reception) pattern for the lowest height results in a high-angle mushroom type of pattern that is not effective for DX work. This pattern is often better for distances out to 1000 miles, compared to antennas at greater height. Different antenna heights result in different feed-point impedances as well. The computer models in Figure 1 are based on elevations above average soil and not over a perfect ground.

Examination of Figure 1B indicates that the antenna lobes are compressed toward ground to yield a lower radiation angle. This is better for DX reception. Pattern C in Figure 1 provides, to some extent, the best of both worlds. Low angle lobes and one high-angle lobe are seen. At this height the antenna is good for DX and close-in work. In all three examples the dipole exhibits the classic figure-8 directivity pattern, but the directivity is emphasized (less omnidirectional) as the height is increased.

What does this mean to the SWL? A make-do antenna at 10 or 20 feet above ground will not pull in those weak DX signals as well as an antenna at 70 feet on 40 meters. The same

wavelength rule applies, irrespective of the chosen operating frequency.

Keep It in the Clear

Not only is antenna height important, but keeping it well away from conductive objects such as power lines, phone lines, house wiring and metal structures is vital to its performance. Conductive objects can detune the antenna and they may block the signal to some extent.

I have been asked, "What about trees?" Generally speaking, trees don't block or absorb enough signal to matter at frequencies below 30 MHz. The lower the operating frequency the less effect the trees have on the signal. Keeping your antenna away from power and phone lines will also help reduce the unwanted pickup of man-made noise.

Final Comments

If you want a ball-park rule to follow when installing your MF and HF antennas, try to get them at least 1/2 wavelength above ground. This applies not only to horizontal dipoles, but to inverted Vs and Yagis as well.

A balun transformer is not needed for HF-band wire dipoles. Always strive to match the feed line to the antenna in order to ensure a flat or balanced feed line.

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Use A Frequency Counter As a Digital Readout For an Analog Receiver

It is often asked (and just as often, I shudder) if a frequency counter can be used as a digital readout on an analog receiver. In a word, YES, it can. I wish this subject could end on that note, but I wouldn't be doing my job and our beloved Editor would have my head on a platter.

A frequency counter can make for a very accurate digital readout for almost ANY receiver, as long as you have a little understanding of the innards and general layout of the model on which you're predisposed to operate. There's the rub: out of about 158,944 different kinds of receivers out there, there is usually only ONE way to apply that cherished frequency counter to each receiver. See what you've got me up against this month? How about a pie-in-the-face contest, instead? I'll volunteer...

Basic Receiver Principles

First, you have to understand receivers in general because, since WWII, most work pretty

much the same way with the "superheterodyne" (superhet) principle. Figure 1 is a block diagram of a typical superhet, "dual conversion" receiver. Study it as we move along.

Radio signals (RF) are generally measured in millionths of a volt (microvolts, mV). One million mV equals one volt, which ain't much. Fortunately, it doesn't take much. Somewhere between 100-mV and 1,000-mV is sufficient for even the most deaf of receivers to operate well; however, the radio signals of interest to hobbyists are substantially less. Therefore, most receivers have a special section right in the front door called an RF Amplifier, Preamplifier or sometimes, the RF Front End.

The RF Front End establishes a receiver's SENSITIVITY. Its purpose is to amplify weaker signals above ambient and man-made noise by a factor of 10 to 50 before sending them on to the second stage, the 1st MIXER.

In the 1st Mixer the preamplified incoming

signal is mixed with an internal, locally generated signal from the 1st Local Oscillator (1st L.O.), which in modern receivers is better termed as the VCO (Voltage Controlled Oscillator) of a PLL (Phase-Locked-Loop). The principle is the same: a fixed (non-variable) frequency is injected into one "port" of the 1st Mixer while the amplified RF signal is injected into another port.

Mixers produce four distinct outputs: (1) the original RF signal; (2) the original L.O. or VCO-PLL signal, (3) the sum of the two, and (4) the difference between the two. Here's an example of what I mean: suppose 10 MHz WWV is the RF signal and the L.O. signal is 40 MHz: then the output of the 1st Mixer contains four frequencies: 10 MHz, 40 MHz, 50 MHz and 30 MHz. Now the next section of the receiver is usually some sort of a basic amplifier stage with a filter or a tuned input/output to accept either the *sum* or the *difference* frequency *only* and to reject the other three. Typically, this 1st Intermediate Frequency Amplifier (1st I.F.) is designed for the *sum* frequency, (up conversion), but it could go the other way, too.

In our example, the 1st I.F. signal would be the sum, or 50 MHz, with the other three rejected by the selectivity of the 1st I.F. amplifier. One or two stages of amplification are usually apparent before this 1st I.F. signal is injected into a 2nd Mixer, the principles of which are pretty much identical to the first. As the 50 MHz signal is injected into one port of the 2nd Mixer, so too, another locally generated signal from a 2nd L.O. or VCO-PLL is injected into the other port.

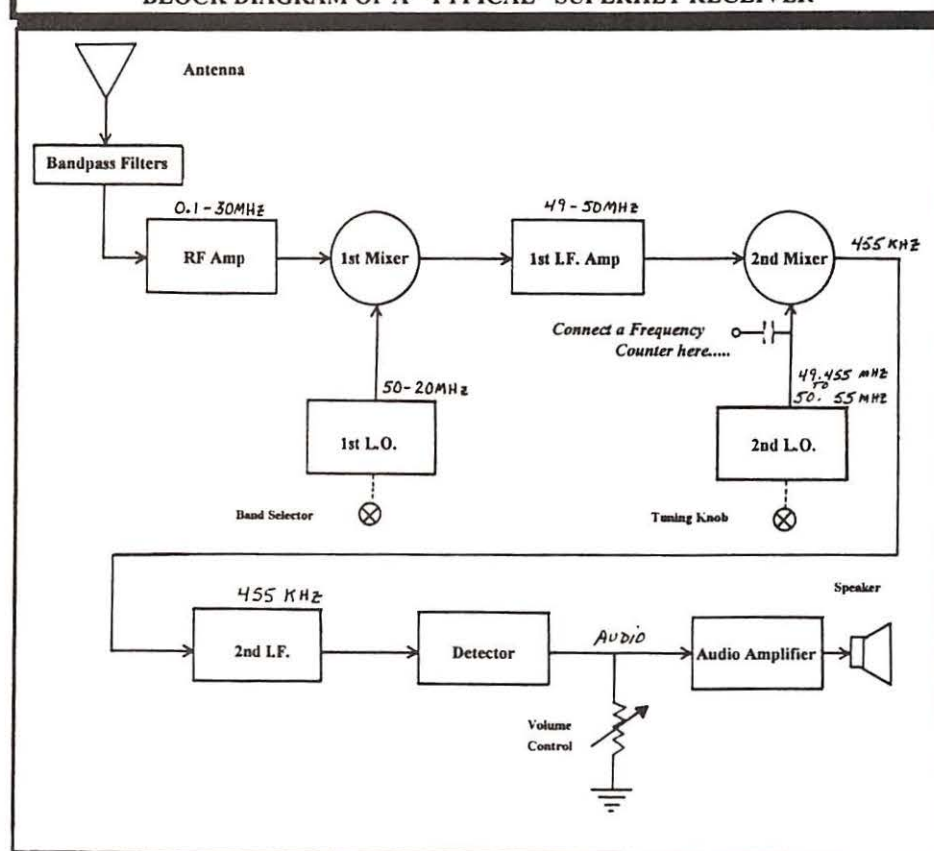
Now this is usually where any similarity to the 1st Mixer ends, for here is where the receiver's tuning process usually takes place! Instead of a fixed frequency L.O. injection, the 2nd L.O. or VCO is usually a *variable* frequency which is controlled by the operator from the receiver's main tuning dial.

Variations

The 1st L.O. is rarely variable by the external tuning mechanism, but it might very well be adjusted in steps or increments by the Band Selector of the receiver. For example, a receiver designed to tune from 0 to 30 MHz in 1 MHz "bands," might have a 1st L.O. or VCO so designed to inject 30 different fixed frequencies, in an inverse relationship, say starting at 49 MHz for the receiver's 0-1 MHz band; 44 MHz for 5-6 MHz band, 35 MHz for the 14-15 MHz band and 20 MHz for 29-30 MHz.

In our example, the 1st L.O. might inject 40 MHz into the 1st Mixer if you were tuning the 9-10 MHz band. This scheme would then produce

Figure 1
BLOCK DIAGRAM OF A "TYPICAL" SUPERHET RECEIVER



a constant 1st I.F. output of 49 to 50 MHz, regardless of the band to which the receiver is tuned! (Remember, in our example, the 1st Mixer produces the sum of its input frequencies, so if we are set to the 9-10 MHz band, and had a 9 MHz signal coming in, the output would be 9 MHz + 40 MHz = 49 MHz). Set to the same band, a 10 MHz incoming signal would produce a 50 MHz output.

Another thing to remember here is that the 1st I.F. amplifier has to have some selectivity to reject the other three products of the 1st Mixer. This is easily accomplished through broadband tuning or filtering.

Now back to the 2nd Mixer; let's assume it to be a *difference* mixer this time. Remember, the 49-50 MHz 1st I.F. will be injected into one of its ports. Suppose the 2nd L.O. was designed to be adjustable from the main tuning dial over a range of exactly 49.455 MHz (low end, Bandsread = 0) to 50.455 MHz (high end, Bandsread = 1000), then it can be seen that no matter the position of the tuning dial, the output of the 2nd Mixer will *always* be 455 kHz, the 2nd I.F.—a very commonly used intermediate frequency, by the way.

While this is a considerable over-simplification of the design of a receiver, it serves to illustrate the method by which a frequency counter can be used to determine the frequency to which the receiver is tuned. Before we tackle that, however, let's finish the description of a "typical" receiver for the benefit of those whose interest has been heightened so far.

There are usually two or three stages of 2nd I.F. amplification, with each stage filtered or tuned solely to 455 kHz. This is where the *selectivity* of the receiver is determined. The 2nd I.F. is then fed to the detector stage of the receiver where the I.F. "envelope" is removed and audio or data signals are extracted and then fed to several audio amplifier stages for eventual output to a speaker.

Each stage of a receiver, by the way, is a science and a study all unto itself. There are design engineers and technicians who know nothing outside the realm of RF preamplifiers; others' mission in life is the design of oscillators; and so on. So we certainly can't dissect the modern receiver in these two pages.

Hooking in the Frequency Counter

First and foremost, you had better know the voltages in your receiver! Modern solid-state stuff rarely has anything over 12-VDC after the power supply, but older tube-type receivers are filled with potentially lethal voltages of 250v-500v. Even if you survive a shock, your frequency counter won't last for the blink of an eye if it's directly connected to anything much over 25-volts. The first rule of thumb when connecting a frequency counter to *any* equipment is to first attach the ground lead of the counter to the

ground or chassis of the equipment to be tested.

Next, and this is *very important*, you must use a DC-blocking capacitor between the test point in the circuit and the hot (+) test lead of the counter. This capacitor prevents DC voltages from entering and slaying your valued frequency counter. The voltage rating of the capacitor must be about twice the highest expected voltage in the equipment. For tube-type receivers, a capacitor rated at 600-WVDC (working volts DC) is mandatory. For solid state receivers, a 35-volt capacitor is usually sufficient. For general applications, the value of the capacitor can be between 0.01-mF to 0.1-mF.

When a counter is used as a digital readout for a receiver, a much smaller capacitor is necessary, something on the order of 2-mmF (pF) to maybe 47-mmF. Next, you'll need to locate the L.O. injection port of the 2nd Mixer and attach the capacitor to that port.

Now it's all over but the shouting. You need only learn to interpret the readout of your counter to have a pretty good idea of what frequency is tuned. If you were receiving WWV at 10 MHz on the 9-10 MHz band per our example, the frequency counter should display 50.455 MHz. But to be truthful, the counter will display 50.455 MHz *any* time the receiver is tuned to the exact top end of the bandsread for each 1 MHz band. Conversely, it will display 49.455 MHz at the low end of each 1 MHz band, and 49.955 MHz at the midpoint.

Therefore, some knowledge of your receiver and an ability to interpret the readout is necessary. Your own situation might be more or less complicated than our example, where you would mentally subtract 455 kHz from the readout, drop the two digits left of the decimal and then add the digits of the band that's selected on the receiver.

Most receivers differ quite radically from each other and the scheme that works for one probably will not work for another, unless it's the same brand. If you are interested in pursuing this to a more refined degree, then it may be best to make a minor modification to your receiver by installing a BNC or an RCA jack somewhere, and internally wiring it up to the capacitor via a short coax to the receiver's variable L.O. injection port at the appropriate Mixer. That way, the receiver can be all buttoned up safely and the counter can easily be attached or disconnected. In most cases, this method of deriving a digital readout for the receiver will entail a fair measure of mental gyration and cranial dexterity, but if you are up to it, heck, go for it. The exercise will do you some good.

On the Negative Side

There are limitations to this and *any* digital readout, even those of modern receivers. What you see in the readout is not necessarily accurate.

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Several variables come to mind, any and all of which can affect accuracy of the readout.

First is the TIME BASE of the frequency counter (and all digital readouts are basically frequency counters). If the time base is not stable and accurate, then the readout will be off by the same proportion. (See last month's column on this subject!)

Next are the accuracies of the injection oscillators (1st & 2nd L.O.). If these are in error or not what you *think* they are, then the readout will be in error by the same proportion. Digital readouts are not a panacea by any stretch of the imagination, and there are additional points for error that are too involved to discuss here. The correct approach to interpreting a digital readout is with a little flexibility and tolerance.

After all, modern receivers are very stable and accurate, but those old, drifting analog boat anchors are the primary targets for frequency counters. A little experience can help, along with frequent verification against known accurate signals such as WWV, CHU and other world time and frequency standards.

There you have it. Now WHAT would you like to see here next? Your suggestions are always welcome! I invite you to write to me with your ideas, tips, tricks, hints and kinks. Anything in the domain of shortwave listening and VHF-UHF scanning is fair game. Happy Springtime!

MT

A Multi-Purpose Antenna: The Full-Wavelength Loop

Some radio enthusiasts feel that vertically-mounted, full-wavelength loops (fig. 1A) are one of the best kept secrets in the realm of excellent-performing but little-used antenna designs. Such loops have a bit more gain (about 2 dB) than a halfwave dipole, are reported to respond less to noise than most other antennas, and are good DX antennas for receiving or transmitting.

But There's More

By changing the point at which the feedline is attached to the antenna, the signal polarization for the antenna can be shifted from vertical to horizontal. If that isn't enough, with a slight change in the way the feedline is attached to the receiver, a loop can serve as a random-length receiving antenna. Add an antenna tuner and this modification works well for transmitting, too.

On The Other Hand

When a full-wavelength loop is turned and mounted parallel to the ground (fig. 1B) it produces vertical radiation which supports short-haul, high-end MF and low-end HF communications out to perhaps 600 miles. This is particularly effective in hilly terrain where antennas with low-angle radiation often just won't support communications.

So with all these factors to recommend it, let's take a look at how we go about making these antennas.

Let's Make One

For a full wavelength loop you will need a length of wire determined by the formula below. Use any size wire that is strong enough to last — size 12 to 14 is a good choice—braided or hard drawn copper will resist breaking well.

$$\text{Length(in ft)} = 1005/\text{frequency(in MHz)}$$

$$\text{Length(in meters)} = 306/\text{frequency(in MHz)}$$

For example, for a 10 MHz loop the length would be 100.5 feet or 30.6 meters.

See the feature article on a circular loop cut for television. A circular shaped loop gives the highest gain, a square more gain than a rectangle, but the loop can be any handy shape and still function OK. For HF square loops you will need four insulators (three if you shape the antenna as a triangle, etc.) for holding the wire in place, and one "center" insulator. For VHF loops you will need two plastic pipe or fiberglass tubing cross arms (fig. 1C).

You can use the top part of the mounting mast as one of the cross arms (fig. 1C); this will save having to attach the antenna to the mast. Add some support ropes for HF loops or a mast for VHF loops, and a length of coaxial cable with a plug to match your rig's antenna socket and you're ready to start building the antenna.

A. Cut the wire to length.

B. For HF loops slip the wire through one end of

each insulator. For VHF loops cut the cross arms to length, make center notches in the arms, and put holes in the arm ends for the wire. Glue the arms into a cross and run the wire through the holes in the arm tips.

C. For HF loops wrap the wire ends to the remaining insulator as shown. Scrape the wire bright where the coax will attach, then solder the center conductor of the coax to one wire and the shield of the coax to the other. Seal the open end of the coax with coax sealer if the loop is used outside.

D. For HF loops add ropes to the unused ends of the insulators; for VHF loops mount the antenna frame on a non-metallic mast. Mount the antenna as high and in the clear as possible.

For vertical polarization, orient the antenna with the feedpoint at the middle of the bottom (fig. 1A) or top. For horizontal polarization, orient it with the feedpoint at the middle of one side.

E. Don't forget lightning protection. The minimum is to never operate during weather likely to produce lightning, and disconnect and ground the antenna when it is not in use.

Using the Loop

This antenna's gain is greatest broadside to the plane containing the loop, but it is responsive to signals from all directions. If you connect the center conductor and shield of the coax together at the receiver end of the feedline, and then connect them to the center connection of the antenna input of your receiver, the antenna essentially becomes a random-length antenna. With an antenna tuner it can also be used in this fashion for transmitting.

Radio Riddles

Last Month

Last month we recalled how a beam antenna pointing toward the horizon is actually always pointing toward the antipodes: the spot on the exact opposite side of the world from the beam antenna's location. We also discussed how a signal transmitted from the beam can continue on that same path, continue on past the antipodes, and by the "round the world" path travel right back to the location where it was originally transmitted. As a matter of fact, if it is then still strong enough, it may go on around again, and even again.

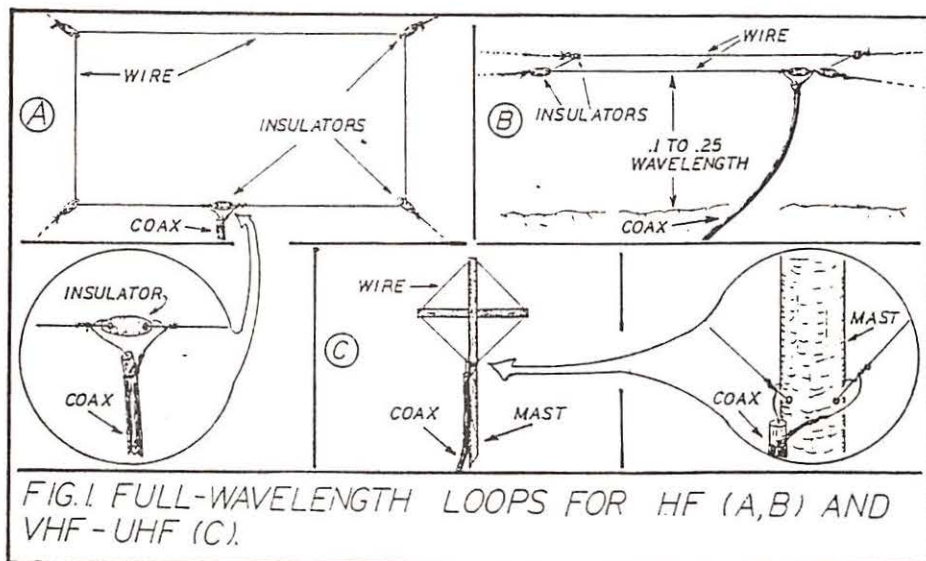


FIG. 1 FULL-WAVELENGTH LOOPS FOR HF (A, B) AND VHF - UHF (C).

Our riddle was then: "Is it possible to transmit signals to yourself in this fashion, and if it were possible, how long would you have to wait to hear yourself?"

Well, it takes only 1/7th of a second for a radio wave to travel around the world, and so your receiver would have to be switched back into operation that quickly after transmitting ceases in order to respond to the signal as it returns to the backside of your antenna. And, obviously, your antenna must be responsive to signals coming in from this "back door" direction which is opposite to the direction from that in which the signal was originally transmitted. Bidirectional beams and nondirectional antennas are then more likely to support this sort of reception than are unidirectional beams. Having the antenna mounted high and in the clear is important for success in this "self communication."

John Kraus, in his autobiography *The Big Ear*, tells about checking for 'round-the-world DX openings with his early W8JK beam by listening for his own signal to return in this fashion. The W8JK beam is bidirectional, and therefore would respond well to the signal coming back to the opposite side of the beam from which it was transmitted.

In the early days of wireless, the legendary "Imperial Beam," provided England with the first reliable world-wide radio communication the world had known. Transmitting with this antenna, Marconi's operators could sometimes hear not only one pass from their signals going on an around-the-world trip, but occasionally even several passes!

This Month

We sometimes read that HF radio waves which leave the antenna at high angles, especially those waves heading straight upward, pass through the ionosphere and on into space. But is this necessarily true? And what if you did make a HF loop as described above and mounted it parallel to the ground (fig. 1B)? And what is "NVIS" anyhow, or "BLOS" for that matter?

Here's A Riddle That I Can't Answer; Can You Help?

I have heard several reports of mysterious signals which have a number of people across the nation wondering what is going on. These signals seem to come and go, sometimes as if they were turned on and off with a switch. They are reported to have a frequency of 17-20 Hz, which would place them in the extremely low frequency band of the radio-frequency spectrum. As this is also the low end of the audio frequency band, only those persons with good hearing at the low end of the audio range can hear these signals.

For those that do hear the sound, it is described as anywhere from "unusual," "annoying," "distracting," "sounding like a truck idling," or "a humming sound," to causing ear aches and loss of sleep, or even disturbing a person's sense of balance! As of yet no one seems to have an explanation for the signals, although some are trying to blame them on aliens! These signals are so mysterious that various newspapers and even *People* magazine (9/21/92) have carried articles about them.

Do these signals propagate as a radio signal? Are audio signals produced by objects in the environment responding to some incoming radio wave of a higher frequency? Are they produced by some mechanical oscillations propagating from a distant source? Are they are generated locally at each site where they are heard? Are they are caused in some other way? If you have any information on these signals I'd like to hear from you. Just drop me a line in care of *Monitoring Times*. If we can accumulate enough meaningful information, I'll report back to you on this intriguing mystery.

And so, 'til next time, Peace, DX, and 73.

M_T

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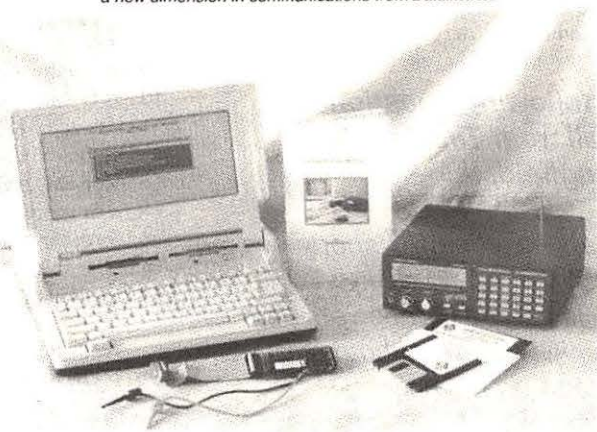
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Send check or money order to Datametrics, Inc., 2575 South Bayshore Dr., Suite 8A, Coconut Grove, FL 33133. 30 day return privileges apply.

In our February issue a reader asked about San Francisco's traffic report radio system. Leo Martin sends the details.

AutoTalk is a free service provided by the Transportation Department and Highway Patrol and transmits voice on 59.68 MHz, just below the audio frequency of TV channel 2. A similar system is used on channel 36 for the South Bay (San Jose) area.

While special receivers are available for about \$120, continuous coverage scanners like the PRO-2006 do the job nicely.

Q. I understand most receiver specifications, but what is "dynamic range"? (Several readers)

A. All receivers have limits to handling weak and strong signals. Expressed in decibels (dB), a receiver's dynamic range is the ratio of the weakest signal that can be heard to the strongest signal that doesn't cause overload problems (intermodulation, desensitization, etc.).

The following questions are all from Tim Rapps of Springfield, IL.

Q. Can an effective shortwave antenna like the Grove Skywire be used with lower cost receivers like the Sony ICF-2010 without producing overload problems?

A. Not without a preselector like the Grove

TUN-4. The lower-priced radios simply don't have the wide dynamic range (ability to handle very weak and very strong signals simultaneously) of the more expensive desktop receivers.

Q. Can I run a shortwave dipole inside my attic and still expect good reception?

A. Yes, provided the roof is not sheet metal, the antenna is at least 30-40 feet in length, as straight and high as practical, and not run alongside long lengths of electrical wiring or metal air duct. It's always a good idea to feed such an antenna with coax to avoid electrical noise pickup from household appliances.

Q. My scanning antenna doesn't seem to pull in weak stations like it did a couple of years ago. What should I check?

A. Moisture intrusion into outdoor coax fittings is common; undo the connectors and check for moisture and corrosion. If there are signs of corrosion, cut off the connector and about six inches of cable and attach a new connector. Coat the connector with a coax sealant when reattached.

If the cable is more than five years old it is probably best to replace it. Belden 9913 is about the best, but it's big, expensive, and hard to find small connectors for. Outdoor TV cable—RG-6/U—is an excellent substitute.

Use an ohmmeter to see whether high resistances have built up between riveted electrical connections. An ohm or two is acceptable; 10-20 ohms or more is not. Wiggle the elements back and forth carefully to see if the resistance lowers. If it doesn't, replace the antenna. If it does, replace it in the near future—it'll only get worse again!

Q. I already have my scanner antenna atop a 40 foot tower, but

trees surround it. Should I raise it above tree level for better reception?

A. Wet summer foliage can take its toll in UHF signal strengths, but I can still hear 800 MHz signals 100 miles away and I'm surrounded by thousands of acres of forest land.

Keep in mind, too, that extra height also means extra loss in the coax cable. If just a few feet gets you above the trees, great; if not, forget it unless you go to low-loss feedline and perhaps an antenna-mounted preamp.

Q. If I already have a problem with intermodulation (strong signal overload) on my receiver, will adding an external preamplifier just aggravate the problem?

A. Yes.

Q. Can I use a 222-225 MHz ham antenna for 225-400 MHz military satellite monitoring? (Tim Rapps, Springfield, IL)

A. Probably so, but I would recommend shortening the element lengths by about 15% (roughly 3-1/2" total length).

For 240-270 MHz military satellite monitoring, such an antenna should have circular polarization to accommodate the tumbling motion of the birds in orbit.

Is there an interest out there for a commercially manufactured MILSATCOM receive antenna? Let us know.

Q. How does the \$60 Grove Scanner Beam compare to the \$240 Create log periodic antenna? Am I wasting my money if I buy the expensive LP?

A. Even though I am the original designer of the Grove Scanner Beam, I personally use the Create. The reason, however, is not for better reception, but because it has directivity on 50 MHz, is more durable over time and with it I can transmit higher power.

The Grove is made of lightweight TV antenna material while the Create uses heavy duty aluminum tubing. This quality difference is reflected in the price difference. The actual on-air reception of the two antennas is very nearly the same.

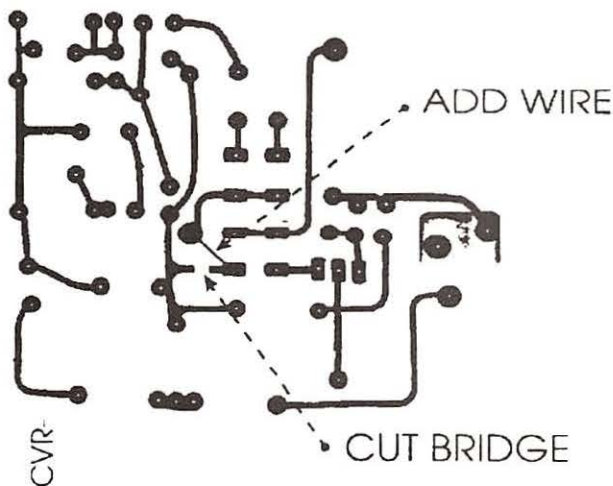
Questions or tips sent to "Ask Bob", c/o MT, are printed in this column as space permits. If you desire a prompt personal reply, mail your question along with a self-addressed stamped envelope (no telephone calls, please) in care of MT.

Bob's Tip of the Month

Grove CVR-1 Scanverter Mod

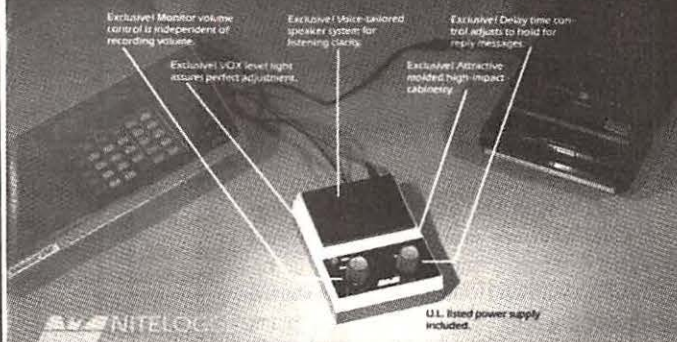
The Grove CVR-1 Scanverter, which allows shortwave reception on a standard scanner, has been a popular accessory, but the double balanced mixer unit can be destroyed if the antenna jack is shorted out with power applied. An easy fix isolates the DBM from the voltage and prevents the burnout.

Using a pointed tool, scratch a break in the trace as shown; next, solder a small wire between the two points as shown. This completes the protective modification.



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Club Circuit

Club Profiles

Houston Area Scanners and Monitoring Club (HASMC)

The Houston Area Scanners and Monitoring Club is a new club for shortwave and scanner listeners living within a 75 mile radius of downtown Houston. The club started with several objectives in mind: it plans meetings twice a year (June and January), it gives a frequency list of area frequencies to all members, and it plans to establish a club computer bulletin board.

They anticipate special monitoring events and guest speakers, newsletters, and technical assistance. Full membership is \$14, but a limited membership of \$7 is available with no voting privileges or frequency list.

For more information, call Glen Dingley [713] 388-1514 or Don Chapman at 388-1514, or write HASMC, 909 Michael, Alvin, TX 77511.

North Central Texas SWL Club

Another club just trying to get organized in the Texas area is the North Central Texas SWL Club, which began with three members. What areas of listening are covered? Whatever its members are experienced or interested in. If a scanner expert joins the club—hey, the club covers VHF/UHF! Getting in on the ground floor of a club is a good way to be appreciated.

If you live in the North Central Texas area, why not contact them? Write Alton (Al) Coffey, K5QWW/KTX5QWW, 1830 Wildwood Drive, Grand Prairie, TX 75050.

ANARC Report

The Association of North American DX Clubs is an umbrella organization which currently represents 18 clubs. It recently held its annual meeting at the Winterfest held in Kulpville, PA, at which it announced the recipients of its annual awards:

North American Shortwave Broadcaster of the Year - Rich D'Angelo; North American Specialty Band DXer of the Year - Mike Hardester; International DXer of the Year - Gabriel Ivan Barerra.

Although most member clubs are listed in *MT*, a complete list of ANARC clubs is available for a Self Addressed Stamped Envelope (SASE) in the US and one International Reply Coupon worldwide. Send to ANARC, c/o Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610.

Another umbrella organization, the European DX Council, is planning for its next EDXC Conference—in the Canary Islands! Closing date for registration is April 30, and the conference is May 28-31st. For more information, contact Michael Murray, Secretary General EDXC, P.O. Box 4, St. Ives Huntingdon, Cambs PE17 4FE, England; (0480) 68885.

Club Listings M-Z

Metro Radio System: Julian Olansky, P.O. Box 26, Newton Highlands, MA 02161, (617) 969-3000. New England states; Public Safety. *M.R.S. Newsletter*.

Michigan Area Radio Enthusiasts: Bob Walker, P.O. Box 81621, Rochester, MI 48308. Michigan & surrounding; All bands. *Great Lakes Monitor*.

MONIX (Cincinnati/Dayton Area Monitoring Exchange): Mark Meece, 7917 3rd St., West Chester, OH 45069-2212, (513) 777-2909. Cincinnati/Dayton area; Full spectrum SW and scanning.

National Radio Club: Paul Swearingen, Publisher, P.O. Box 5711, Topeka, KS 66605-0711. Worldwide; AM/FM. *DX News* 30 times yearly, sample for a 29 cent stamp.

NYC Radio Fre(ak)Qs: Joe Alverson, 199 Barnard Ave., Staten Island, NY 10307, 718-317-5556. NY boros & LI; VHF/UHF/HF utilities.

North American SW Assoc.: Bob Brown, Executive Dir., 45 Wildflower Lane, Levittown, PA 19057. Worldwide; Shortwave broadcast only. *The Journal*.

North Central Texas SWL Club: Alton Coffey, 1830 Wildwood Drive, Grand Prairie, TX 75050. Central TX area; All bands.

Northeast Ohio SWL/DXers: Donald J. Weber, P.O. Box 652, Westlake, OH 44145-0652. NE Ohio; SWBC and utilities.

Northeast Scanner Club: Les Mattson, P.O. Box 62, Gibbstown, NJ 08027, (609) 423-1603 evenings. Maine thru Virginia; UHF/VHF, public safety, aircraft, military. *Northeast Scanning News (NESN)*.

Ontario DX Association: Harold Sellers, General Mgr., P.O. Box 161, Station A, Willowdale, Ontario M2N 5S8, Canada, (416) 853-3169 voice & fax, (416) 444-3526 DX-Change information svce. Predominantly Province of Ontario; SWBC, utility, MW, FM-TV, scanning, technical, propagation. *DX Ontario*.

Pacific NW/BC DX Club: Phil Bytheway, 9705 Mary

NW, Seattle, WA 98117, (206) 356-3927. WA, OR, ID, BC; DXing all bands.

Pakistan SW Listeners Club: Mrs. Fatima Naseem, Sultanpura, Sheikhpura, 39350 Pakistan; Pakistan; SWBC.

Pitt City SW Listeners Club: L. Neal Sumrell, Rt. 1 Box 276, Sumrell Rd., Ayden, NC 28513-9715. Eastern NC; Shortwave bands. *The DX Listeners*.

Puna DX Club: Jerry Witham, P.O. Box 596, Keaau, HI 96749; Puna, HI; SW and MW.

Radio Monitors of Maryland: Ron Bruckman, P.O. Box 394, Hampstead, MD 21074. Maryland; VHF/UHF/HF utilities. *Radio Monitors Newsletter of MD*.

RCMA (Radio Communications Monitoring Assn.): Carol Ruth, Gen'l Mgr., P.O. Box 542, Silverado, CA 92676. North America, Europe, Australia; All modes above 30 MHz. *RCMA Journal*.

Regional Communications Network (RCN): Bill Morris, Public Info. Officer, Box 83-M, Carlstadt, NJ 07072-0083. 50 mile radius of NY City; 2-way Radio Public safety notification group.

Rocky Mountain Monitoring Enthusiasts: James Richardson, 11391 Main Range Trail, Littleton, CO 80127, 303-933-2195. Regional Rocky Mtn area; scanner monitoring.

Rocky Mountain Radio Listeners: Wayne Heinen, 4131 S. Andes Way, Aurora, CO 80013-3831. Colorado Front Range; All bands. Annual meeting calendar for an SASE.

Southern California Area DXers (S.C.A.D.S.): Don R. Schmidt, 3809 Rose Ave., Long Beach, CA 90807-4334, (310) 424-4634. California area; AM, FM, TV, scanner and shortwave broadcasting.

Southern Cross DX Club Inc.: G.P.O. Box 1487, Adelaide, SA 5001, Australia. Australia, New Zealand, South Pacific; All bands. *DX Post*.

SPEEDX (Society to Preserve the Engrossing Enjoyment of DXing): Bob Thunberg, Business Mgr., P.O. Box 196, DuBois, PA 15801-0196. Worldwide; SWBC, utilities. *SPEEDX* monthly newsletter.

Susquehanna City Scanner Club: Alan D. Grick, P.O. Box 23, Prospect St., Montrose, PA 18801. PA area; Scanning all bands.

Toledo Area Radio Enthusiasts: Ernie Dellinger, N8PFA, 6629 Sue Lane, Maumee, OH 43537. NW Ohio and SE Michigan; Shortwave, scanning, amateur.

Triangle Area Scanner/SW Listening Group: Curt Phillips, KD4YU, P.O. Box 28587, Raleigh, NC 27611. Central NC.

World DX Club: Arthur Ward, 17 Motspur Drive, Northampton, England NN2 6LY (in USA-Richard D'Angelo, 2216 Burkey Drive, Wyomissing, PA 19610). United Kingdom and worldwide. SW, MW broadcasting DX, FM & TV DX, amateur radio. *Contact*.

New Additions:

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, 6536 N. Francisco 3E, Chicago, IL 60645. Chicago & midwest. Public safety & general coverage. *CARMA Newsletter*.

Finnish DX Association: Mr. Risto Vahakainu, Suomen DX-Liitto, P.O. Box 454, SF-00101 Helsinki, Finland. Finland and worldwide. SW and BCB. *Radiomaailma*.

Long Island Sounds: Ed, 2134 Decker Ave, North Merrick, NY 11566. Public Safety. Net Tues 8pm 147.445. *Newsletter*.

Wasatch Scanner Club: Jon Van Allen, 2872 West 7140 South, West Jordan, UT 84084. State of Utah. VHF/UHF. *Newsletter/directory*.

Looking to Start a Club:

Sylvester Kapchinski
1907 Dartmouth #1708
College Station, TX 77840
Scanning

SPECIAL EVENT CALENDAR

Date	Location	Club/Contact Person
Apr 2-3	No Little Rock, AR	Arkansas State Convention/James Warlick, AA5ZI 8807 Willhite Rd., No Little Rock, AR 72116.
Apr 3	Virginia Beach, VA	Chesapeake ARS/Preston Ippock, N4SHI 1026 Calloway Ave., Chesapeake, VA 23324.
Apr 3	Perry, GA	Georgia State Convention/Donald Hoover, KD4FAP 1412-A Russell Pkwy, Suite 210, Warner Robins, GA 31088.
Apr 3-4	Spokane, WA	Spokane ARC/Ivan Brown, KF7PU E537 Nebraska, Spokane, WA 99207.
Apr 4	Southington, CT	Southington ARA Flea Market/P.O. Box 873, Southington, CT 06489. Location: Southington HS, 9 am to 1 pm, \$10 admission, talk-in on 146.28/88.
Apr 4	Raleigh, NC	Raleigh ARC/Chuck Littlewood, K4HF 2005 Quail Ridge Rd., Raleigh, NC 27609.
Apr 4	Grosse Pointe Woods, MI	SE Michigan ARA/John Mears, N8IPJ 1732 Anita, Grosse Pointe Woods, MI 48236.
Apr 10	Clinton, TN	Oak Ridge Hamfest/Oak Ridge ARC, Ray Adams, N4BAQ 4325 Felty Drive, Knoxville, TN 37918. Location: National Guard Armory, 8 am to 5 pm. \$4 admission, talk-in on 146.88.
Apr 16-19	Visalia, CA	No California DX Convention/James Knochenhauer, K6ITL 133 Sylvan Ave., San Mateo, CA 94403.
Apr 18	Rockford, IL	Rockford ARC/Joseph Roling, N8HEZ 5850 Strathmoor Dr., Rockford, IL 61007.
Apr 17	Bowling Green, KY	Kentucky Colonels ARC Hamfest/Jim Honaker, N4WKJ P.O. Box 9781, Bowling Green, KY 42102. Location: National Guard Armory on Hwy 231, 7 am to 2 pm, \$4 admission. Talk-in on 146.25/85 repeater.
Apr 23-25	Dayton, OH	Dayton Hamvention/Bill Schmid, WD8LOI PO Box 964, Dayton, OH 45401.
May 1	Downsview, Ontario	ODXA 1993 Convention/Steve Canney, 416-222-9658 Location: Ramada 400/401 Hotel, 1677 Wilson Ave.
May 2	Yonkers, NY	Metro 70 cm Network/Otto Supliski, WB2SLQ 53 Hayward St., Yonkers, NY 10704.
May 8	Columbia, MO	Central Missouri Radio Assoc/Wayland "Mac" McKenzie, Jr. 8000 S. Barry Road, Columbia, MO 65201.
May 9	Medina, OH	Mepina M2M Group Inc./Jan Miller 600 Oak St., Medina, OH 44056.
May 14-16	Tulsa, OK	Oklahoma State Section Convention/Ernie Buck, WB5CDW 3630 South Wheeling, Tulsa, OK 74105.
May 16	Peotone, IL	Kankakee Area Radio Society/Don Kerovac, K9NR 1377 NW Circle Dr., Kankakee, IL 60901.
May 16	Wheeling, WV	Triple States RAC/Ralph McDonough, K8AN Box 240, Rte. 1, Adena, OH 43901.
May 22	Kansas City, MO	PHD KC Mid-West AR Convention/Chuck Miller, W4KUH PO Box 11, Liberty, MO 64068.
May 22-23	Henrietta, NY	Rochester Hamfest/Rochester ARC, 300 Shite Spruce Blvd, Rochester, NY 14623, 716-424-7184. Location: Monroe Co Fairgrounds.
May 29-30	Gastonia, NC	Gastonia ARC Hamfest/Mike Jackson, N4AYO 2568 Devon Dr., Dallas, NC 28034. Location: Karyae Park.

Monitoring Times is happy to run brief announcements of radio events open to our readers. Send your announcements at least 60 days before the event to:

Monitoring Times Special Event Calendar,
P.O. Box 98, Brasstown, NC 28902-0098

INDEX OF ADVERTISERS

Advanced Electronics Applications	87
Aerial Dev. of New England	45
AIE Corporation	63
Antique Radio Classified	17
ARRL	27
ASC Information Systems	97
Ashton ITC	9
W.J. Battles Enterprises	9
BBC World Service	65
BMI	107
CD Applications	55
Cellular Security Group	91
Chilton Pacific	3
Commtronics	7
Communications Electronics	11
Connect Systems	57
CQ Communications	17
Dallas Remote Imaging	107
Datametrics	105
Jacques d'Avignon	80
Delta Research	107
R.L. Drake Company	63
EBS Consultants	15
EEB (Electronic Equipment Bank)	21
Fort Worth Computers	49
Galaxy Electronics	93
GRE America	56
Grove Enterprises	47,57,69,75,76,95
Glenn Hauser	29
Ham Companion	56
ICOM America	Cover IV
Intercepts Newsletter	43
J&J Enterprises	101
Japan Radio Company	Cover III
KIWA	9,45
Klingenfuss	37
Lentini Communications	23
LJ Electronic Ind. (Transel Tech)	45
Microcraft Corporation	99
MilSpec Communications	105
Monitoring Times	5
Motron Electronics	99,101
National Scanning Report	9
Naval Electronics	57
OFS Weatherfax	25
OptoElectronics	Cover II
Palomar Engineering	97,103
Pioneer Data	43
Radio Accessories	49
Radioware Corp.	23
RDI White Papers	97
Satman	49
Scanner World	39
Signs Unlimited	3
Skyvision	43
Software Systems Consulting	7,65
Tiare Publications	17,41
TRS Consultants	15
Universal Electronics	51
Universal Radio	65
V-Comm (ScanStar)	99
Viking International	13
World Com Technology	15

DX RADIO TESTS

The International Radio Club of America (IRCA), is a club devoted to the hobby of hearing distant stations on the standard AM broadcast band. For more information, or a sample issue of DX Monitor, write to: The International Radio Club of America (IRCA), 11300 Magnolia #43, Riverside, CA 92505, USA. Please enclose 1 U.S. dollar or 3 IRCs if you are requesting a sample issue.

These tests were arranged by J.D. Stephens for IRCA.

Thursday, April 1, 1993: WCPM-1280. 101 Keller Street, Cumberland, KY 40823, will conduct a DX test between 1:00 and 1:15 am EST. The test will include tones and voice IDs. Reception reports may be sent to: Mr. J. George Bibb, KS4K, President.

Monday, April 19, 1993: WVHI-1330. Third and Main, Evansville, IN 47708, will conduct a DX test from 1:00-4:00 am EDT. The test will include Morse code, tones, voice IDs and various types of music. Reception reports may be sent to: Mr. Ralph Turpen, KA90WT, Vice President/Chief Engineer.

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date. All ads must be paid in advance to *Monitoring Times*. Ad copy must be typed for legibility.

Monitoring Times assumes no responsibility for misrepresented merchandise.

NON-COMMERCIAL SUBSCRIBER RATES: \$.25 per word - *Subscribers only*. All merchandise must be personal and radio-related.

COMMERCIAL RATES: \$1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: \$50 per issue. Send camera-ready copy or copy to be typeset. Photo-reduction \$5 additional charge. For more information on commercial ads contact Beth Leinbach, 704/389-4007.

PROSCAN FREQUENCY MANAGER. Innovative DOS software. Track 9,999 frequencies. Indispensable for the scanner enthusiast. Fast, easy-to-use. SASE for details. Datafile, Box 20111MT, St. Louis, MO 63123.

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VOICEGATE swl noise reduction systems! 2 stamp SASE for catalog. Jabco, 15961 W. Bethel, Alexandria, IN 46001.

THE QUANTUM LOOP — A compact, high gain ferrite rod antenna for serious BCB DXers. Details — SASE. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504.

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LETTERS cont'd

area, and Tom is anxious about the impact on news reporting. Please write to Tom Hirsch, WESH-TV-2 News, Box 547697, Orlando, FL 32854-7697.

• Bill Hennessy of Marble Falls, TX, has been bitten by the antique radio bug, but is finding it hard to get information. While *MT* just doesn't have the room to devote to a column on oldies but goodies, I know some folks who specialize in it. Check out these two publications, and they will point you to other books and articles on the subject: *Antique Radio Classified*, P.O. Box 2, Carlisle, MA 01741 (\$29.95/year; dedicated to buying and selling old radios); *Electric Radio*, 4 Aspen Place, Durango, CO 81301 (\$24/year; primarily ham-related tube equipment).

• A reader "Asked Bob" in the February issue about a traffic reporting system for the San Francisco area and how it might work. Joel Rubin of SanFran replies: "I can receive them on my MTS stereo-equipped Sharp VCR on the (parallel) Second Audio Programs of channels 2 (KTUV, Oakland) and 36 (KICU, San Jose), so I assume the radio they're selling is just a TV audio receiver with a SAP decoder."

• February's "Ask Bob" also contained an item on energy saving light bulbs. We received this curious item from Dick Holbert of Rochester Gas and Electric Corp. "Our Power Quality engineer, Dave Shields, has been working on various problems caused by harmonics on the electric distribution system and radiated RFI from sources such as fluorescent lights, dimmers, variable speed motor drives and switching type power supplies.

"Dave's most unusual case, which he demonstrates at trade shows, is an electronic air ionizer which produced severe harmonics on the 120VAC waveform causing extra zero crossings in each cycle. This caused the digital alarm clock in the house across the street, fed from the same distribution transformer, to run at 2-4 times normal speed. This caused the customer with the alarm clock to be awakened at 3 am with the clock indicating 6 am if the neighbor ran the air ionizer at night!"

Thanks to Dick and the many others of you who sent in their congratulations to Grove Enterprises on receiving the Governors' Award. While that was certainly an honor, it is your good opinion we value the highest.

We hope you enjoy our invitation to antenna experimentation in this rare topical April issue. Please be sure to observe safe procedures, and then let us know which of your ingenious creations brought in the best monitoring times!

Rachel Baughn,
Editor

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Letters I Don't Answer

Over the years, dealing with tens of thousands of Grove Enterprises customers and *Monitoring Times* readers, I have received quite a few letters which I DIDN'T answer, especially if they did not bother to include a self-addressed, stamped envelope (SASE). Some samples (not verbatim) follow:

Dear Bob: I just bought \$2000 worth of equipment from one of your competitors, but they don't seem to know much about it. Tell me how to operate it.

Dear Bob: I think Martians are in control of my body; could the static on my radio be caused by death rays?

Dear Bob: Send me everything you have on radio frequencies.

Dear Bob: I would like to order a JRC NRD-535, ICOM R71A and Drake R8 receiver to see which one I like. If I decide to keep one, will you pay return shipping on the others?

Dear Bob: Apparently while I was sleeping, someone placed a tiny radio receiver in my ear. Everywhere I go I can hear people talking about me. How was this done? Send me all the information you have on this subject.

Dear Bob: I am planning a trip to Zimbabwe. Send me a list of frequencies used by their taxi cab services.

Dear Bob: I looking for job as a tipist, let me no wen to come buy for a intervnu.

Dear Bob: Your editorial seven months ago really annoyed me. Refund my full subscription immediately.

Dear Bob: I know that I haven't sent return postage in my last 86 letters, but I really appreciate your answers to my questions. Today I have a few more.

Dear Bob: I bought a scanner from one of your competitors, but I don't like it. Will you send me a refund?

Dear Bob: I have called your toll-free line six times and talked with six different people who all gave me the same answer to my question. Now I would like your opinion.

Dear Bob: About a year and a half ago I bought a Bearcat scanner from you. Recently it fell from a sixth story window onto the pavement below. It hasn't worked properly since and I would like a refund.

Letters I Do Answer:

Dear Bob: Is a longer antenna always better? I've included a self-addressed, stamped envelope (SASE) for your reply.

Dear Bob: I would like to buy one of everything in the Grove catalog. Would you like my credit card number?

Dear Bob: I haven't heard from you in nearly two weeks. (signed) Mom.

Bob Grove
Publisher





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"...campers are advised to leave upper elevations before sundown due to..."

"...conditions for trout in the deeper pools best before 6 am, they're taking..."

"...bright yellow, red trim Piper last reported lost and disoriented in fog near..."

"...sending a chopper over to have a look before the news people find out about..."

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